

GENERAL NOTES

- ALL WORK PERFORMED SHALL BE DONE IN STRICT ACCORDANCE TO ALL APPLICABLE MECHANICAL, BUILDING, ENERGY, FUEL GAS, AND LOCAL CODES, WITH AMENDMENTS.
- WHERE USED, THE TERM "PROVIDE" SHALL MEAN "FURNISH AND INSTALL".
- COORDINATE MECHANICAL WORK WITH THE GENERAL CONTRACTOR AND CO-CONTRACTORS AS APPLICABLE.
- A SHORT DASH IN A SCHEDULE TABLE CELL INDICATES THAT THE COLUMN HEADING IS NOT USED OR NOT APPLICABLE TO THAT SCHEDULED ITEM.
- ALL PIPING & DUCTWORK IN FINISHED ROOMS OR SPACES SHALL BE CONCEALED IN A FURRED CHASE OR ABOVE THE HARD SUSPENDED CEILING. [COORDINATE WITH ARCHITECTURAL DOCUMENTS FOR FURRING & CHASE LOCATIONS & SIZES].
- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH NFPA 70 STANDARDS AND LOCAL REQUIREMENTS.
- ALL FIELD WIRING SHALL REQUIRE AN ELECTRICAL PERMIT AND SHALL BE PERFORMED BY A LICENSED ELECTRICIAN.
- ACCESS DOORS WHERE REQUIRED SHALL BE FURNISHED BY ASEEI.

HVAC/SHEET METAL:

- THE FIRST FIGURE OF DUCT SIZE CALLOUTS INDICATES DIMENSION OF FACE SHOWN OR INDICATED. DUCT SIZES ARE NET INSIDE DIMENSIONS. PROVIDE ANY APPLICABLE DUCT LINING AND INSULATION PER THESE PLANS.
- TOTAL STATIC PRESSURE NOTED IN SCHEDULES SHALL BE ASSUMED TO INCLUDE DUCT SYSTEM, TERMINAL UNITS, FILTERS, COILS, ETC.
- ALL SUPPLY AIR FILTERS SHALL BE AS SCHEDULED.
- AIR TERMINAL SIZES SHOWN ON PLANS ARE NECK SIZES. PROVIDE ADDITIONAL PANS, HARDWARE, ETC., REQUIRED TO INSTALL AIR TERMINAL IN CEILING SYSTEM.
- DUCTWORK SHALL BE LOW PRESSURE.
- CONSTRUCT DUCTWORK ACCORDING TO WASHINGTON STATE ENERGY CODE SECTION C403.10.2. ALL DUCT WORK SHALL BE PRIMED GALVANIZED SHEET STEEL, LOCK FORMING QUALITY, FABRICATED IN ACCORDANCE TO SMACNA STANDARDS. DUCT GAUGES AND SUPPORTS ARE PER IMC. ALL DUCT TRAVERSE SEAMS AND LONGITUDINAL JOINTS SHALL BE SEALED.
- PROVIDE TURNING VANES IN ALL MITERED RECTANGULAR DUCT ELBOWS & TEES.
- PROVIDE MOTORIZED DAMPERS ON OUTDOOR AIR SUPPLY, AND EXHAUST OPENINGS. DAMPERS SHALL HAVE A MAXIMUM LEAKAGE RATE OF 4 CFM PER SQUARE FOOT AT 1" W.C. WHERE SHOWN.
- VENTILATION AND EXHAUST AIR IS PROVIDED IN ACCORDANCE WITH IMC 403.3.1.1.
- PROVIDE EACH ZONE WITH THERMOSTATIC CONTROLS THAT PROVIDE A DEADBAND OF AT LEAST 5 DEGREES FAHRENHEIT IN WHICH HEATING OR COOLING ENERGY IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM. THERMOSTAT SHALL BE CAPABLE OF THERMOSTATIC SETBACK, AUTOMATIC SETBACK AND SHUTDOWN, AND AUTOMATIC START CAPABILITIES PER WASHINGTON STATE ENERGY CODE SECTION C403.4.
- PROVIDE TEMPORARY COVERS OVER OPEN ENDS OF EQUIPMENT AND DUCTWORK DURING CONSTRUCTION.
- PROVIDE MANUAL VOLUME DAMPER FOR EACH DIFFUSER, REGISTER, AND GRILLE.
- ASSESS TO AIR BALANCE ALL SYSTEMS TO WITHIN 10% OF DESIGN AIRFLOW UPON PROJECT COMPLETION.
- ALL SUPPLY AND RETURN DUCTWORK SHALL BE INSULATED AND SEALED PER WASHINGTON STATE ENERGY CODE SECTION C403.10.1.

PIPING:

- INSULATE PIPING PER WASHINGTON STATE ENERGY CODE SECTION C403.10.3.
- ALL PRESSURES LISTED ARE GAGE PRESSURES UNLESS OTHERWISE NOTED.
- PROVIDE COMPLETE CONDENSATE DRAINAGE SYSTEM FOR ALL EXTERIOR EQUIPMENT TYPES HERE. FIELD ROUTE DRAINAGE PIPING FROM EQUIPMENT TO NEAREST DRAIN LOCATION (SUCH AS SERVICE SINK, FUNNEL DRAIN, ETC.). SLOPE NON-PRESSURIZED DRAIN PIPING TO DRAIN LOCATION. PIPING & FITTINGS SHALL BE PVC OR CPVC/COPPER USE [CPVC/COPPER] FOR ALL PLENUM APPLICATIONS OR WHERE NONCOMBUSTIBLE PIPING IS REQUIRED. MINIMUM PIPE SIZE SHALL BE 3/4". INCREASE PIPE SIZE WHERE APPLICABLE PER IMC 307.2.2.
- VALVES SHALL BE INSTALLED SO THAT SYSTEM REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON EQUIPMENT SIDE OF VALVE IS REMOVED.
- VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE FULL SIZE OF PIPE BEFORE REDUCING SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS UNLESS OTHERWISE NOTED.
- THE PROPOSED ROUTING FOR THE REFRIGERATION PIPING BETWEEN THE INDOOR AND OUTDOOR UNITS IS INDICATED AS A SINGLE LINE ON THE PLANS. THAT SINGLE LINE REPRESENTS ALL THE PIPING RUNS REQUIRED FOR THE SYSTEM DESIGNED. SIZE REFRIGERANT LINES PER MANUFACTURER'S RECOMMENDATION.

COORDINATION NOTES

- GENERAL CONTRACTOR TO CUT AND PROVIDE OPENINGS FOR ALL ROOFTOP CEILING, FLOOR, AND WALL PENETRATIONS, INCLUDING WEATHERPROOF SEALING, ASEI TO PROVIDE SIZE AND LOCATION.
 - GENERAL CONTRACTOR TO PROVIDE FRAMED OPENINGS WHERE REQUIRED FOR ALL MECHANICAL PENETRATIONS, INCLUDING HEADERS IF REQUIRED. GENERAL CONTRACTOR TO VERIFY PENETRATION LOCATIONS WITH ASEI BEFORE FRAMING OPENINGS.
 - GENERAL CONTRACTOR TO PROVIDE SERVICE ACCESS PER CODE TO ALL MECHANICAL EQUIPMENT.
 - GENERAL CONTRACTOR TO PROVIDE STRUCTURE FOR MOUNTING AND HANGING MEMBERS OF MECHANICAL EQUIPMENT.
 - GENERAL CONTRACTOR TO PROVIDE ALL CUTTING OF T-BAR CEILING AND EXTRA MATERIAL AS REQUIRED FOR HVAC INSTALLATION.
 - GENERAL CONTRACTOR TO PROVIDE ACCESS PANELS IN HARD LID CEILING.
- PLUMBING CONTRACTOR**
- ASEI TO FURNISH AND INSTALL ALL CONDENSATE DRAIN LINES PER CODE.
 - PLUMBING CONTRACTOR TO OFFSET VENTS 10 FEET MINIMUM FROM ALL HVAC FRESH INTAKES.
- ELECTRICAL CONTRACTOR**
- ELECTRICAL CONTRACTOR TO PROVIDE ALL ELECTRICAL CONNECTIONS, DISCONNECTS, AND MOTOR STARTERS FOR MECHANICAL EQUIPMENT.
 - ASEI TO INSTALL ALL 24 VOLT LOW VOLTAGE WIRING FOR THERMOSTATS.
 - ELECTRICAL CONTRACTOR TO PROVIDE 120V SERVICE OUTLET WITHIN 25 FEET OF EACH PIECE OF MECHANICAL EQUIPMENT.
 - ELECTRICAL CONTRACTOR TO INSTALL ALL LINE VOLTAGE WIRING AND CONDUIT.
- COMPLETION**
- PROVIDE TEST AND BALANCE REPORT, EQUIPMENT STARTUP TEST REPORTS, OPERATION AND MAINTENANCE MANUALS, AND AS-BUILT RECORD DRAWINGS, AS APPLICABLE, TO OWNER UPON PROJECT COMPLETION.

GENERAL CONTRACT REQUIREMENTS

- THE DRAWINGS ARE DIAGRAMMATIC. COORDINATE INSTALLATION WITH THE BUILDING, PROVIDE ALL NECESSARY OFFSETS, CHANGES IN DIRECTION, EXTENSIONS AND ASSOCIATED MATERIALS FOR A COMPLETE AND FUNCTIONAL INSTALLATION. COORDINATE MECHANICAL WORK WITH ELECTRICAL, ARCHITECTURAL, AND STRUCTURAL WORK SHOWN ON OTHER CONTRACT DOCUMENTS. PROVIDE ADDITIONAL PIPE OR DUCT OFFSETS WHERE REQUIRED TO COORDINATE INSTALLATION.
- LOCATIONS AND SIZES OF FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH OTHER TRADES INVOLVED.
- MAINTAIN A SET OF PLANS ON SITE. RECORD ALL CHANGES TO ACTUAL ARRANGEMENTS ON THESE PLANS. PROVIDE THE SET OF PLANS TO THE OWNER'S REPRESENTATIVE WHEN WORK IS COMPLETE.
- PROJECT SCHEDULING: COMPLY WITH OWNER'S REQUIREMENTS.
- OPERATION AND MAINTENANCE MANUAL: PROVIDE COMPLETE OPERATIONS AND MAINTENANCE MANUAL IN HARD COVER. PROVIDE OPERATIONS, MAINTENANCE AND PARTS DATA ON ANY ITEM OR EQUIPMENT UPON PROJECT COMPLETION.
- WARRANTY PROVISIONS: THE CONTRACTOR SHALL GUARANTEE ALL EQUIPMENT AND SYSTEMS FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE. REPAIR OR REPLACE DEFECTIVE MATERIAL, EQUIPMENT, OR POOR WORKMANSHIP, WHICH MAY SHOW ITSELF DURING THIS WARRANTY PERIOD.

SEISMIC AND VIBRATION REQUIREMENTS

- HANGERS AND SEISMIC BRACING FOR THE MECHANICAL SYSTEMS SHALL BE DESIGNED AND PROVIDED BY THE MECHANICAL CONTRACTOR. REFER TO DRAWINGS FOR LOCATIONS OF EQUIPMENT AND HANGERS. MECHANICAL CONTRACTOR SHALL COORDINATE THE SUPPORT SYSTEMS AND DESIGN LOADS FOR HUNG MECHANICAL SYSTEMS WITH THE GENERAL CONTRACTOR AND OTHER TRADES THAT MAY BE IMPACTED.
 - PROVIDE ALL SEISMIC RESTRAINT REQUIRED BY THE AUTHORITY HAVING JURISDICTION AND THE APPLICABLE CODES.
- VIBRATION CRITERIA: PROVIDE VIBRATION ISOLATION IN ACCORDANCE WITH THE AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS (ASHRAE) APPLICATIONS HANDBOOK.

BASIC MATERIALS AND METHODS

- ALL MATERIALS AND EQUIPMENT SHALL BE LISTED OR LABELED BY A RECOGNIZED AGENCY: UL, ADA, FM, CSA, ARI, ETC.
- EQUIPMENT SHALL BE AS INDICATED ON THE DRAWING SCHEDULES. THE DRAWING SCHEDULES ESTABLISH THE LEVEL OF QUALITY.
- MECHANICAL SYSTEM PENETRATIONS OF FIRE RATED ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH THE BUILDING CODE IN FORCE IN THE AUTHORITY HAVING JURISDICTION FOR THIS PROJECT. THIS INCLUDES PIPING, DUCTWORK, SUPPORTS, FLOORING AND OTHER SYSTEM AND APPURTENANCE PROVIDED AS PART OF THE MECHANICAL WORK OF THIS CONTRACT.
- MOTORS SHALL COMPLY WITH THE WSEC.
- ELECTRICAL INSTALLATION SHALL COMPLY WITH THE NEC.
- PROTECT OF STORED MATERIALS. REPLACE DAMAGED MATERIALS PRIOR TO INSTALLATION.
- PROVIDE WATER-TIGHT SEAL FOR OPENINGS TO THE BUILDING THROUGH WHICH PIPE PASSES.
- PROVIDE AND INSTALL PIPE SUPPORTS IN ACCORDANCE WITH MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS) STANDARDS, SPECIFICALLY STANDARD SP-89, "PIPE HANGERS AND SUPPORTS - SELECTION AND APPLICATION" AND STANDARD SP-58, "PIPE HANGERS AND SUPPORTS - MATERIALS, DESIGN AND MANUFACTURE". PROVIDE PIPE SUPPORT SPACING IN ACCORDANCE WITH THE UPC OR IMC.
- TESTING: ALL WORK UNDER THIS CONTRACT SHALL BE THOROUGHLY AND SYSTEMATICALLY TESTED, BOTH DURING CONSTRUCTION AND AFTER COMPLETION. PIPE TESTING SHALL BE EITHER AS SPECIFIED IN THE APPROPRIATE SPECIFICATION SECTION, OR AS SPECIFIED IN THE APPLICABLE PLUMBING OR MECHANICAL CODE. DUCTWORK SHALL BE TESTED AS PART OF THE AIR BALANCING PROCESS. NOTIFY THE OWNER'S REPRESENTATIVE 48-HOURS IN ADVANCE OF ALL TESTS. TESTS SHALL BE MAINTAINED UNTIL APPROVED.
- START-UP, BALANCING AND COMMISSIONING.
 - EQUIPMENT STARTUP SHALL BE PERFORMED BY QUALIFIED PERSONNEL. THE TECHNICAL SPECIFICATION SECTIONS WILL DETAIL OTHER SPECIAL REQUIREMENTS, IF ANY. PROVIDE A STATEMENT OF THE STARTUP TECHNICIAN'S QUALIFICATIONS IF REQUESTED.
 - BALANCE ALL AIR SYSTEMS. BALANCE IN ACCORDANCE WITH EITHER NATIONAL ENVIRONMENTAL, BALANCING BUREAU (NEBB) OR AMERICAN AIR BALANCE COUNCIL (AABC) CRITERIA.
 - PROVIDE COMMISSIONING IN ACCORDANCE WITH THE WSEC.

AIR DISTRIBUTION SYSTEM - GENERAL

- PROVIDE PER THE IMC, THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA) "DUCT CONSTRUCTION MANUAL, METAL AND FLEXIBLE," AND THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
- IN ADDITION TO THE REQUIREMENTS ABOVE, INSTALL EQUIPMENT AND COMPONENTS IN ACCORDANCE WITH THE PUBLISHED MANUFACTURER'S INSTALLATION REQUIREMENTS. FIRE DAMPERS: UL LISTED FOR SERVICE INTENDED. INSTALL IN ACCORDANCE WITH THE LISTING. BASIS OF DESIGN SHALL REPRESENT THE QUALITY OF THE PRODUCT.
- FLEXIBLE CONNECTIONS: PROVIDE AT EACH FAN AND AIR HANDLING UNIT CONNECTION TO DUCT.
- ACCESS PANELS: PROVIDE FOR MAINTENANCE OF ALL DUCT-MOUNTED EQUIPMENT (FIRE DAMPERS, CONTROL DAMPERS, COILS, ETC.).
- LOCATE VALVES, CLEANOUTS, DAMPERS, CONTROLS AND SIMILAR COMPONENTS SO THAT THEY ARE ACCESSIBLE.
 - INSTALL TAG ON CEILING GRID FRAME TO INDICATE LOCATION AND TYPE OF EQUIPMENT THAT REQUIRES MAINTENANCE.
- PROVIDE ACCESS DOORS FOR MECHANICAL EQUIPMENT" INSTALLED BEHIND WALLS, ABOVE INACCESSIBLE CEILINGS AND BELOW FLOORS. COORDINATE ACCESS DOOR LOCATIONS WITH ARCHITECT/ENGINEER. ACCESS DOOR SHALL BE SIZED SO THAT ADJACENT EQUIPMENT IS ACCESSIBLE.
 - PROVIDE 16 GA. STEEL, FLUSH TYPE ACCESS DOOR WITH CONCEALED HINGE AND SLOT SCREWDRIVER TYPE CAM LATCH. PROVIDE FACTORY PRIMED AND PAINTED SURFACE AREAS FOR FIELD PAINTING.
 - PROVIDE STAINLESS STEEL FOR ALL OTHER AREAS. PROVIDE UL LISTED AND LABELED DOOR WHERE FIRE-RESISTANCE RATING IS INDICATED ON DRAWINGS.
 - PROVIDE DUCT ACCESS PANELS FOR FIRE DAMPER ACTUATOR ACCESS.

LOW PRESSURE STEEL DUCTWORK

- GALVANIZED CARBON STEEL PER SMACNA STANDARDS.
- FLEXIBLE DUCTWORK SHALL BE VINYL COATED SPRING STEEL HELIX BONDED TO A VINYL COATED FIBERGLASS MECH-LINER WRAPPED WITH FIBERGLASS WOOL INSULATION. JACKET WITH A REINFORCED METALIZED MYLAR NEOPRENE LAMINATE OUTER CASING.

FANS

- SCHEDULED FANS SHALL BE THE BASIS OF DESIGN. UNITS OF SIMILAR CONSTRUCTION AND CAPABILITIES MAY BE SUBMITTED FOR REVIEW.
- PROVIDE CURBS SLOPED TO MATCH ROOF PITCH FOR ROOF TOP FANS.
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND AS NOTED ON PLANS.
- PROVIDE ACOUSTIC LINING IN CONNECTING DUCTWORK 10' UPSTREAM AND DOWNSTREAM OF FAN, UNLESS OTHERWISE NOTED ON PLANS.

FILTERS

- PROVIDE 2" MERV 8, PLEATED, DISPOSABLE FILTERS. SIZE OF FILTER SHALL BE COMPATIBLE WITH FILTER BOX OR AIR HANDLER.

VRF UNITS

- BASIS OF DESIGN SHALL REPRESENT THE QUALITY OF UNITS.
- MAJOR COMPONENTS INCLUDE:
 - EVAPORATOR AND CONDENSER UNITS.
 - CONTROLS - UNITS SHALL BE CONTROLLED BY MANUFACTURER'S PROPRIETARY TEMPERATURE CONTROL SYSTEM.
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

DEDICATED OUTDOOR AIR UNITS

- BASIS OF DESIGN SHALL REPRESENT THE QUALITY OF UNIT.
- CABINET SHALL INCLUDE FACTORY WIRING, CONTROLS, BLOWERS, FILTERS, INSTALLED INLET AIR THERMISTERS, AND EXHAUSTIVE HEAT EXCHANGER.
- APPROVED MANUFACTURER: PREMISYS.

AIR TERMINALS

- SCHEDULED GRILLES, REGISTERS, AND DIFFUSERS SHALL BE THE BASIS OF DESIGN. UNITS OF SIMILAR CONSTRUCTION AND CAPABILITIES MAY BE SUBMITTED FOR REVIEW. DEVICES SHALL DISTRIBUTE THE QUANTITY OF AIRFLOW UNIFORMLY THROUGHOUT THE INDICATED SPACE WITHOUT CAUSING NOTICEABLE NOISE OR DRAFTS.
- PROVIDE ALL DEVICES FOR COMPLETE INSTALLATION DEPENDING ON LOCATION OF INSTALLATION (IE: A.C. OR HARD LID CEILINGS).
- INSTALL PER MANUFACTURER'S RECOMMENDATIONS AND AS NOTED ON PLANS.

AIR BALANCING

- SCOPE OF WORK INCLUDES SETTING VOLUME FLOW AND SPEED ADJUSTMENTS TO HVAC INSTRUMENTATION USED TO BALANCE THIS SYSTEM SHALL BE IN GOOD CONDITION AND MAINTAINED. IF REQUIRED BY THE OWNER, THE TESTS SHALL BE DONE IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE.
- THE BALANCER SHALL BE AN INDEPENDENT FIRM THAT SPECIALIZES IN BALANCING AND TESTING OF PUMPING SYSTEMS AND AIR MOVING EQUIPMENT/ AIR DISTRIBUTION AND EXHAUST SYSTEMS. THE BALANCER SHALL PROVIDE PROOF OF HAVING SUCCESSFULLY COMPLETED FIVE PROJECTS OF SIMILAR SCOPE. TESTING AND ADJUSTING SHALL BE PERFORMED IN ACCORDANCE WITH NEBB OR AABC STANDARDS AND PROCEDURES.
- DAMAGE DONE TO THE SYSTEM BY THE BALANCER SHALL BE HISHER RESPONSIBILITY TO RECTIFY. NEATLY TYPED RECORDS SHALL BE MAINTAINED AT ALL STEPS, ADJUSTMENTS, AND BEGINNING AND FINAL READINGS. THE RECORDS SHALL ALSO INCLUDE MEASUREMENT LOCATIONS, DESIGN CAPACITIES, AND DATES AND NAMES OF PERSONNEL INVOLVED. FINAL SETTINGS SHALL BE CLEARLY MARKED ON EACH BALANCING DEVICE.
- CHECK OUT TEMPERATURE CONTROLS TO ASSURE PROPER CONTROL SEQUENCE, PROPER CONTROL SETTINGS, AND PROPER CONTROL CALIBRATION. REPORT MALFUNCTIONS IN LOGS UNDER "ADDITIONAL REMARKS."
- AIR BALANCE LOG:
 - TEST AND ADJUST ENTIRE SYSTEM WITHIN SCOPE OF WORK. VOLUMES SHALL BE WITHIN 10% OF DESIGN REQUIREMENTS.
 - MEASURE TOTAL STATIC PRESSURE INCLUDING DUCT SYSTEM, TERMINAL UNITS, FILTERS, ETC.
 - ADJUST AND RECORD SYSTEM TO DESIGN RECIRCULATED AIR CFM.
 - DIFFUSERS, GRILLES AND REGISTERS SHALL BE ADJUSTED TO MINIMIZE DRAFTS IN ALL AREAS.
 - ALL FILTERS SHALL BE CLEAN AND IN PLACE BEFORE STARTING FANS.
 - DATA: RECORD AND CHECK THE FOLLOWING SYSTEMS AND EQUIPMENT.
 - AIR TERMINALS: SUPPLY, RETURN, OR EXHAUST IDENTIFICATIONS, CATALOGUE IDENTIFICATION, APPLICATIONS FACTORS, DESIGN AND RECORDED VELOCITIES AND AIR QUANTITIES, AND STATIC PRESSURES.

COPPER PIPING

- COPPER PIPING SHALL BE USED CONDENSATE PIPING.
- MATERIALS FOR ABOVE GROUND COPPER PIPE, FITTINGS AND ACCESSORIES. ASTM B88, TYPE 'L'.
- PROVIDE LEAD-FREE SOLDER JOINTS FOR PIPING 2" AND SMALLER.

COPPER LINESET

- COPPER LINESET SHALL BE USED FOR REFRIGERANT PIPING.
- SIZE OF PIPING SHALL BE PER THE MANUFACTURER'S RECOMMENDATION AND REQUIREMENTS.
- MATERIALS FOR COPPER LINESET SHALL BE SOFT ANNEALED COPPER. CONTRACTOR TO SELECT END FINISHING TO SUIT INSTALLATION AND MANUFACTURER'S RECOMMENDATION.

PLASTIC PIPE, DWV & SEWER

- PVC PLASTIC DRAIN, WASTE, AND VENT PIPE AND FITTINGS SHALL BE PER IAPMO INSTALLATION STANDARD (IS) 09-03, "PVC BUILDING DRAIN, WASTE, AND VENT PIPE AND FITTINGS."

PIPING SYSTEM SPECIALTIES

- SPECIALTY PIPE SYSTEMS SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. THEY SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED.
- PROVIDE DIELECTRIC BREAKS BETWEEN DISSIMILAR METALS.
- TEST PLUGS: PROVIDE NIPPLES AND COUPLINGS TO MAKE THE TEST PLUGS EXTEND THROUGH THE INSULATED PIPE.

VALVES

- VALVES SHALL BE CONSTRUCTED OF MATERIALS THAT ARE COMPATIBLE WITH THE TYPE OF PIPING MATERIAL AND FLUIDS IN THE SYSTEM. VALVES SHALL BE RATED FOR THE TEMPERATURES AND PRESSURES OF THE SYSTEMS IN WHICH THE VALVES ARE INSTALLED.

PIPE TESTING

- WASTE AND VENT PIPING SHALL BE TESTED WITH AT LEAST 10 FOOT HEAD OF WATER FOR A PERIOD OF NOT LESS THAN 15 MINUTES. TESTS SHALL BE PER UPC CHAPTER 7. TEST GAUGES SHALL BE PER UPC 318.
- REFRIGERANT PIPING SHALL BE TESTED FOR A PERIOD OF NOT LESS THAN 60 MINUTES AT A PRESSURE NOT LOWER THAN THE DESIGN PRESSURES OR THE SETTING OF THE PRESSURE RELIEF DEVICES. TEST PER IMC SECTION 1110.
- PIPES IS CONSIDERED "PASSED" IF THE PRESSURE REMAINS UNCHANGED FOR THE DURATIONS LISTED ABOVE.

REFRIGERANT PIPE INSULATION

- RUBBER OR FLEXIBLE FOAM STYLE INSULATION FOR REFRIGERANT PIPING SYSTEMS SHALL BE PROVIDED WITH LINER.
- PROVIDE PER THE WSEC AND THE MANUFACTURER'S PUBLISHED INSTRUCTIONS. INSULATION THICKNESSES SHALL COMPLY WITH WSEC.
- LINESET PIPING EXPOSED TO WEATHER SHALL BE PROTECTED FROM DAMAGE. PROVIDE ARMAFLEX SHIELD OR EQUAL IN AREAS THAT ARE EXTERIOR TO THE BUILDING ENVELOPE OR AREAS THAT ARE SUBJECT TO DAMAGE.

APPLICABLE CODES

AS ADOPTED BY THE CITY OF PUYALLUP, WASHINGTON

INTERNATIONAL MECHANICAL CODE, IMC 2018
INTERNATIONAL BUILDING CODE, IBC 2018
WASHINGTON STATE ENERGY CODE, WSEC 2018
INTERNATIONAL FUEL GAS CODE, IFGC 2018
UNIFORM PLUMBING CODE, UPC 2018

AND ASSOCIATED WASHINGTON ADMINISTRATIVE CODE AMENDMENTS

DESIGN CONDITIONS

OUTDOOR CONDITIONS (PUYALLUP)
COOLING: 86°F DB (WSEC)
HEATING: 26°F DB (WSEC)

INDOOR CONDITIONS
COOLING: 75°F DB, 50% RH
HEATING: 70°F DB

SCOPE OF WORK

- PROVIDE VRF SYSTEMS FOR CLASSROOM ADDITION.
- PROVIDE DOAS SYSTEMS FOR ADDITION VENTILATION. PROVIDE DEMAND CONTROL VENTILATION IN CLASSROOM SPACES.
- PROVIDE FREEZE PROTECTION IN SECOND FLOOR SHELL.

SYMBOL



DESCRIPTION

SUPPLY DUCT, OSA DUCT UP

SUPPLY DUCT, OSA DUCT DOWN

RETURN, RELIEF, TRANSFER UP

RETURN, RELIEF, TRANSFER DOWN

RECTANGULAR ELBOW WITH TURNING VANES

ROUND/RECTANGULAR ELBOW

RECTANGULAR DUCT SQUARE ELBOW UP

RECTANGULAR DUCT, RADIUS ELBOW UP

RECTANGULAR DUCT, SQUARE ELBOW DOWN

RECTANGULAR DUCT, RADIUS ELBOW DOWN

EQUIPMENT ABBREVIATION AND NUMBER (TAG)

AIR TERMINAL TYPE, SIZE, AND CFM

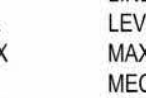
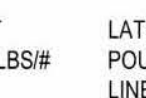
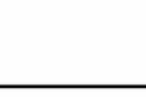
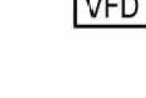
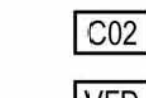
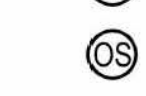
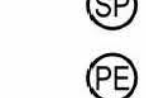
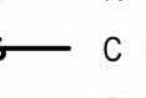
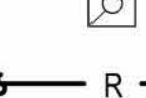
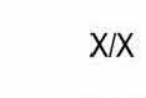
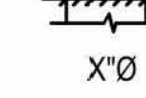
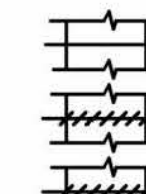
DETAIL NUMBER

DRAWING NUMBER WHERE DRAWN

FLEXIBLE DUCT

MECHANICAL LEGEND

SYMBOL



DESCRIPTION

VOLUME DAMPER (VD)

MOTORIZED DAMPER

BACKDRAFT DAMPER

ROUND DUCT

SQUARE DUCT

SQUARE 4-WAY CEILING DIFFUSERS

RETURN EXHAUST GRILLE

REFRIGERANT PIPING

CONDENSATE

THERMOSTAT (TSTAT)

SPACE PRESSURE SENSOR

PRESSURE ELEMENT

OCCUPANCY SENSOR

CARBON DIOXIDE SENSOR

VARIABLE FREQUENCY DRIVE

ABBREVIATIONS

(E)	EXISTING	LAT	LATERAL
AABC	AMERICAN AIR BALANCE COUNCIL	LB/LBS#	POUNDS/POUNDS
AFB	ABOVE FINISHED FLOOR	LF	LINEAR FEET
AFUE	ANNUAL FUEL UTILIZATION EFFICIENCY	LVL	LEVEL
AG	AIR GAP	MAX	MAXIMUM
AGA	AMERICAN GAS ASSOCIATION	MC	MECHANICAL CONTRACTOR
AHRI	AIR CONDITIONING, HEATING, & REFRIGERATION INSTITUTE	MCA	MAXIMUM CIRCUIT AMPACITY
AMP	AMPERAGE	MERV	MINIMUM EFFICIENCY REPORTING VALUE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION, AND AIR CONDITIONING ENGINEERS	MFG/MFR	MANUFACTURER
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS	MIN	MINIMUM
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS	MOPP/MOP	MAXIMUM OVER CURRENT PROTECTION
BAS	BUILDING AUTOMATION SYSTEM	MSS	MANUFACTURER'S STANDARDIZATION SOCIETY
BHP	BREAK HORSE POWER	NEBB	NATIONAL ENVIRONMENTAL BALANCING BUREAU
CFM	CUBIC FEET PER HOUR	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
CFM	CUBIC FEET PER MINUTE	CC	ON CENTER
COND	CONDENSATE	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
CONFIG	CONFIGURATION	NO	NUMBER
CSA	CANADIAN STANDARDS ASSOCIATION	NOM	NOMINAL
DB	DRY BULB	NTS	NOT TO SCALE
DC	DOUBLE CHECK	CSA	OUTSIDE AIR
DDC	DIRECT DIGITAL CONTROLS	PH	PHASE
df	DEGREES FAHRENHEIT	PSF	POUNDS PER SQUARE FOOT
DIA	DIAMETER	RA	RETURN AIR
DN	DOWN	RH	RELATIVE HUMIDITY
DOAS	DEDICATED OUTSIDE AIR SYSTEM	RP	REDUCED PRESSURE
DX	DIRECT EXPANSION	RPM	REVOLUTIONS PER MINUTE
EA	EXHAUST AIR	SA	SUPPLY AIR
EAT	ENTERING AIR TEMPERATURE	SF	SQUARE FEET
EC	ELECTRICAL CONTRACTOR	SMACNA	SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION
ECM	ELECTRICALLY COMMUTATED MOTOR	SPEC	SPECIFICATION
EFF	EFFICIENCY	THRD	THREADED
ESP	EXTERNAL STATIC PRESSURE	TYP	TYPICAL
ETC	ET CETERA	UL	UNDERWRITERS LABORATORY
EX. SP.	EXTERNAL STATIC PRESSURE	UPC	UNIFORM PLUMBING CODE
FLA	FULL LOAD AMPS	VOLT	VOLTAGE
FM	FACTORY MANUAL	VRF	VARIABLE REFRIGERANT FLOW
FT	FEET	VAV	VARIABLE AIR VOLUME
GA	GAUGE	VERT	

DEDICATED OUTSIDE AIR UNIT SCHEDULE

UNIT NO	MFR	MODEL	LOCATION	CONFIG	AREA SERVED	SUPPLY FAN DATA					EXHAUST FAN DATA					ENTHALPY WHEEL DATA					GAS HEATER DATA				FILTER	WEIGHT LBS	ELECTRICAL				STARTER FURN BY	DISCON FURN BY	NOTES		
						CFM	HP	B-HP	ESP	RPM	CFM	HP	BHP	ESP	RPM	WIN EAT	WIN LAT	WIN EFF	SUM EAT	SUM LAT	SUM EFF	WHEEL HP	TYPE	INPUT			OUTPUT	LAT	MCA	MOP				V	PH
DOAS-01	VALENT	VXE-112-41-30H-G	ROOF	HORIZONTAL DISCHARGE	FIRST FLOOR CLASSROOMS	4380	5	4.88	0.89	2397	3690	5	3.8	0.73	2214	24	50.7	61.2	86.1	79.7	61.5	-	IND RECT	200 MBH	160 MBH	84.5	MERV 8	2520	33.2	45	208	3	MFG	EC	1, 2, 3, 4

NOTES:
 1. PROVIDE WITH MOTORIZED LOW LEAKAGIW OUTDOOR AIR AND RETURN AIR DAMPERS
 2. PROVIDE WITH MANUFACTURER'S SEISMICALLY RATED CURB, SLOPED TO MATCH ROOF PITCH.
 3. PROVIDED WITH TWO STAGES OF HEAT.

INDOOR UNIT SCHEDULE

UNIT NO	MFR	MODEL	TYPE	SYSTEM SERVE	AREA SERVED	AIRFLOW CFM	ESP IN. W.C.	OSA CFM	COOLING (MBH)		HEATING (MBH) TOTAL	WEIGHT	ELECTRICAL				STARTER FURN BY	DISCON FURN BY	NOTES
									TOTAL	SENSIBLE			MCA	MOP	V	PH			
IU-01	NOT USED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IU-02	NOT USED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IU-03	NOT USED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IU-04	NOT USED	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IU-05	MITSUBISHI	PMFY-P12NBMU-ER5	CEILING CASSETTE	OU-01	HALL 108	328	-	-	12	-	13.5	38	0.26	15	208	1	MFG	EC	2, 3, 5
IU-06	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-01	CLASSROOM 109	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5
IU-07	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-01	CLASSROOM 110	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5
IU-08	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-01	CLASSROOM 113	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5
IU-09	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-01	CLASSROOM 112	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5
IU-10	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-01	CLASSROOM 111	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5
IU-11	MITSUBISHI	PLFY-EP24NEMU-E	CEILING CASSETTE	OU-02	CLASSROOM 108	636	-	-	24	-	27	66	0.54	15	208	1	MFG	EC	2, 3, 4, 5

NOTES:
 1. PROVIDE WITH CONDENSATE DRAIN PAN AND CONDENSATE PUMP OPTION.
 2. PROVIDE WITH ALL APPURTUNANCES NECESSARY FOR A COMPLETE INSTALLATION.
 3. SEE CORRESPONDING OUTDOOR UNIT SCHEDULE FOR CAPACITY AND EFFICIENCY DATA.
 4. SET UNIT TO LOW SPEED.
 5. OSA AIR PROVIDED BY DEDICATED OUTDOOR AIR UNIT PER WSEC C403.3.5.3.
 6. ROUTE 14 GA AWG 3WIRE W/ GROUND BETWEEN INDOOR AND OUTDOOR UNIT FOR UNIT POWER.

BRANCH CIRCUIT CONTROLLER SCHEDULE

UNIT NO	MFG	MODEL	WEIGHT LBS	ELECTRICAL				STARTER FURN BY	DISCON FURN BY	NOTES
				MCA	MOP	V	PH			
BCC-01	MITSUBISHI	CMB-P1013	148	1.08	15	208	1	MFG	EC	1, 2

NOTES:
 1. PROVIDE WITH BALL VALVES ON EACH PORT.
 2. PROVIDE WITH CONDENSATE PUMP OPTION.

OUTDOOR UNIT SCHEDULE

UNIT NO	MFR	MODEL	LOCATION	COOLING (MBH)		HEATING (MBH)		WEIGHT (LBS)	ELECTRICAL MODULES				STARTER FURN BY	DISCON FURN BY	NOTES
				TOTAL	IEER (SEER)	TOTAL	COP (HSPF)		MCA	MOP	V	PH			
OU-01	MITSUBISHI	PURY-P192TSKMU-A	FIRST FLOOR	192	19.3	215	3.364	1076	34	40	208	3	MFG	EC	1, 2, 3, 4, 5, 6

NOTES:
 1. COOLING CAPACITY MBH AT 95 D.B. OUTDOOR AND 80 D.B./67 W.B. INDOOR.
 2. HEATING CAPACITY AND EFFICIENCY AT 43 W.B. OUTDOOR AND 70 D.B. INDOOR.
 3. PROVIDE ADDITIONAL REFRIGERANT CHARGE AS REQUIRED TO FULLY CHARGE SYSTEM.
 4. PROVIDE WITH ALL APPURTUNANCES NECESSARY FOR A COMPLETE INSTALLATION.
 5. PROVIDE WITH R410-A REFRIGERANT.
 6. PROVIDE ALL UNITS LOCATED OUTDOORS WITH LOCKING REFRIGERANT ACCESS PORT PER IMC 1101.10

HEATER SCHEDULE

UNIT NO	MFR	MODEL	AREA SERVED	WEIGHT (LBS)	CAPACITY (MBH)	MOTOR (HP)	INPUT (MBH)	OUTPUT (MBH)	EFFICIENCY	ELECTRICAL						STARTER FURN BY	DISCON FURN BY	NOTES
										WATTS	MCA	FLA	MOP	V	PH			
WH-01	INDEECO	WCI	STAIRS 114	30	-	-	-	-	-	1125	5.8	-	-	208	1	MC	EC	1,2,3
GH-01	REZNOR	MODEL F	HALL 208	100	100	1/30	100	80	80%	195	-	-	-	115	1	MC	EC	4,5,6,7

NOTES:
 1. PROVIDE WITH INTEGRAL SINGLE POLE THERMOSTAT. SET THERMOSTAT TO 65 DEG F.
 2. MOUNT HEATER AT 12" ABOVE FINISHED FLOOR.
 3. PROVIDE WITH RECESS WALL CAN.
 4. PROVIDE WITH REMOTE THERMOSTAT. SET THERMOSTAT TO 50 DEG F.
 5. PROVIDE WITH TWO STAGE GAS CONTROL (50% LOW FIRE).
 6. PROVIDE WITH FOUR POINT SUSPENSION KIT.
 7. PROVIDE WITH NATURAL GAS CONNECTION SIZE OF 1/2".

EXISTING EQUIPMENT SCHEDULE

UNIT NO	TYPE	MFR	MODEL	DESCRIPTION/ DATA	SCOPE	NOTES
E-AH-01	AIR HANDLER	MITSUBISHI	PEFY-P36NMAU-E3	36 MBH COOLING, 40 MBH HEATING, 1165 CFM	CONNECT TO BCC-01	
E-AH-02	AIR HANDLER	MITSUBISHI	PEFY-P36NMAU-E3	36 MBH COOLING, 40 MBH HEATING, 1165 CFM	CONNECT TO BCC-01	
E-RTU-01	AIR HANDLER	DAIKIN	DPS020A	300 MBH, 240 MBH, 80 AFUE, 8000 CFM	EXISTING TO REMAIN	
E-RTU-02	AIR HANDLER	DAIKIN	DPS018A	300 MBH, 240 MBH, 80 AFUE, 8000 CFM	EXISTING TO REMAIN	
E-ERV-01	DOAS	LOSSNAY	LGH-F300RVX-E	300 CFM 66% EFFICIENT	EXISTING TO REMAIN	
E-ERV-02	DOAS	LOSSNAY	LGH-F470RVX-E	470 CFM 69% EFFICIENT	EXISTING TO REMAIN	

NOTES:

**City of Puyallup
Development & Permitting Services
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REVISIONS	CHANGE	DATE	DESCRIPTION
	PERMIT SET	03/23/2022	GAS PIPING REVISION
	NG PIPING REVISION	05/20/2022	DOAS DUCT RELOCATION
		07/25/2022	

DESIGN: BSM
 DATE: 03/23/2022
 APPROVED:

CASCADE CHRISTIAN JUNIOR HIGH
 SCHEDULES I
 815 21ST STREET SE
 PUYALLUP, WASHINGTON 98372

Air Systems Engineering Inc.
 AIR CONDITIONING DESIGN & INSTALLATION
 COMFORT USA SYSTEMS
 (253) 575-9884
 3002 SOUTH PINE/FAVORITE, WA 98409

SHEET NO. **M2** OF **9**
 JOB NO. **4126**

MISCELLANEOUS EQUIPMENT SCHEDULE

UNIT NO	TYPE	MFG	MODEL	DESCRIPTION/ DATA	NOTES
PR-01	PRESSURE REDUCING VALVE	MAXITROL	325-3(B)L	2PSI INLET PRESSURE, 250 MBH MAXIMUM LOAD, 1/2"	1
PR-02	PRESSURE REDUCING VALVE	MAXITROL	325-3(B)L	2PSI INLET PRESSURE, 250 MBH MAXIMUM LOAD, 1/2"	2
MD-01	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-02	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-03	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-04	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-05	MOTORIZED DAMPER	GREENHECK	VCD-20	14x14 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-06	MOTORIZED DAMPER	GREENHECK	VCD-20	14x14 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-07	MOTORIZED DAMPER	GREENHECK	VCD-20	14x14 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-08	MOTORIZED DAMPER	GREENHECK	VCD-20	14x12 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-09	MOTORIZED DAMPER	GREENHECK	VCD-20	14x14 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-10	MOTORIZED DAMPER	GREENHECK	VCD-20	14x12 DAMPER, OPPOSED BLADE SINGLE FLANGE.	3
MD-11	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-12	MOTORIZED DAMPER	GREENHECK	VCDR-50	12" DAMPER, BUTTERFLY STYLE.	3
MD-13	MOTORIZED DAMPER	GREENHECK	VCDR-50	6" DAMPER, BUTTERFLY STYLE.	3

- NOTES:
1. PROVIDE WITH 12A09 VENT LIMITING DEVICE.
 2. PROVIDE WITH 13A15 VENT PROTECTOR FOR OUTDOOR APPLICATIONS.
 3. PROVIDE WITH BELIMO LMB24-3 24V, 45 IN-LB TORQUE, ON/ OFF DAMPER WITHOUT SPRING RETURN.

VENTILATION SCHEDULE

ZONE NUMBER	ZONE NAME	PRIMARY AIRFLOW	ZONE OSA, V _{OT}	ROOM NAME	OCCUPANCY DESCRIPTION	A _Z	P _Z DENSITY	P _Z	R _p	OSA _p	R _A	OSA _A	MISC	V _{oz}	DISTRIBUTION EFFECTIVENESS	TOTAL OSA V _{oz}	CORRECTED OSA	EA PER SF	# OF TOILETS	# OF SHOWERS	REQUIRED EA	NOTES
1	DOAS 1		4380	108 CLASSROOM	CLASSROOM 9+	920	35	33	10	330	0.12	111		441	0.8	552	590				0	
				108 HALL	CORRIDOR	945.5	0	0	0	0	0.06	57		57	0.8	72	150				0	
				109 CLASSROOM	CLASSROOM 9+	927.2	35	33	10	330	0.12	112		442	0.8	553	590				0	
				110 CLASSROOM	CLASSROOM 9+	922.3	35	33	10	330	0.12	111		441	0.8	552	590				0	
				111 CLASSROOM	SCIENCE CLASSROOM	921	25	24	10	240	0.18	166		406	0.8	508	850	1			921	
				112 CLASSROOM	SCIENCE CLASSROOM	926	25	24	10	240	0.18	167		407	0.8	509	850	1			926	
				113 CLASSROOM	SCIENCE CLASSROOM	921	25	24	10	240	0.18	166		406	0.8	508	850	1			921	
				114 STAIRS	CORRIDOR	140	0	0	0	0	0.06	9		9	0.8	12	0				0	
				115 STORAGE	STORAGE	88.4	0	0	0	0	0.12	11		11	0.8	14	0				0	

- GENERAL NOTES:
1. ZONE NAME AND NUMBER CORRESPONDS TO LOAD CALCULATION.
- NOTES:
1. EXHAUSTED AT 70 CFM/ FLUSH VALVE FIXTURE.
 2. SERVED BY EXISTING DOAS.

REFRIGERANT MANAGEMENT SCHEDULE

OUTDOOR LUNIT	INDOOR UNITS	ROOM NAME	ROOM AREA	ROOM HEIGHT	VOLUME	REFRIGERANT QUANTITY	REFRIGERANT LBS/1000 CF	ALLOWED REFRIGERANT PER 1000 SF	NOTES
OU-01	IU-01	NOT USED	-	-	-	-	-	-	
OU-01	IU-02	NOT USED	-	-	-	-	-	-	
OU-01	IU-03	NOT USED	-	-	-	-	-	-	
OU-01	IU-04	NOT USED	-	-	-	-	-	-	
OU-01	IU-05	108 HALL	945	9	8505	58.3	6.85	26	
OU-01	IU-06	109 CLASSROOM	932	9	8388	58.3	6.95	26	
OU-01	IU-07	110 CLASSROOM	923	9	8307	58.3	7.02	26	
OU-01	IU-08	113 CLASSROOM	921	9	8289	58.3	7.03	26	
OU-01	IU-09	112 CLASSROOM	926	9	8334	58.3	7.00	26	
OU-01	IU-10	111 CLASSROOM	917	9	8253	58.3	7.06	26	
OU-01	IU-11	108 CLASSROOM	918	9	8262	58.3	7.06	26	
OU-01	E-AH-01/02	1XX SCHOOL LOBBY	1752.97	9	15776.73	58.3	3.70	26	

NOTES:

DUCT INSULATION SCHEDULE

DUCT SYSTEM	DUCT LOCATION AND USE	CLIMATE ZONE	AIRFLOW	MINIMUM INSTALLED DUCT INSULATION R-VALUE ^{a,b}	NOTES
OUTDOOR AIR	INSIDE CONDITIONED SPACE AND UPSTREAM OF AUTOMATIC SHUT OFF DAMPER.	4C AND 5B	≥2800 CFM	4.5	SEE SECTION C403.10.1.1 FOR ADDITIONAL REQUIREMENTS
OUTDOOR AIR	INSIDE CONDITIONED SPACE AND DOWNSTREAM OF AUTOMATIC SHUT OFF DAMPER TO H-VAC UNIT OR ROOM.	4C	≥2800 CFM	3.0	
OUTDOOR AIR	INSIDE CONDITIONED SPACE AND DOWNSTREAM OF AUTOMATIC SHUT OFF DAMPER TO H-VAC UNIT OR ROOM.	5B	≥2800 CFM	2.5	
OUTDOOR AIR	INSIDE CONDITIONED SPACE	4C AND 5B	≥2800 CFM	1.5	SEE EXCEPTION 1 TO SECTION C403.10.1.1 FOR ADDITIONAL DETAILS

- A. INSULATION R-VALUES, MEASURED IN h · ft² x °F/BTU, ARE FOR THE INSULATION AS INSTALLED AND DO NOT INCLUDE FILM RESISTANCE. THE REQUIRED MINIMUM THICKNESSES DO NOT CONSIDER WATER VAPOR TRANSMISSION AND POSSIBLE SURFACE CONDENSATION. INSULATION RESISTANCE MEASURED ON A HORIZONTAL PLANE IN ACCORDANCE WITH ASTM C518 AT A MEAN TEMPERATURE OF 75°F AT THE INSTALLED THICKNESS.
- B. SEE INTERNATIONAL MECHANICAL CODE SECTIONS 603.12 AND 604 FOR FURTHER DETAILS ON DUCT INSTALLATION REQUIREMENTS.

PIPE INSULATION SCHEDULE

FLUID OPERATING AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL OR TUBE SIZE (inches)				
	BTU · in/(h · ft ² · °F)	TEMPERATURE, °F	< 1	1 to 1-1/2	1-1/2 to < 4	4 to < 8	≥8
> 350	0.32 - 0.34	250	4.5	5.0	5.0	5.0	5.0
251 - 350	0.29 - 0.32	200	3.0	4.0	4.5	4.5	4.5
201 - 250	0.27 - 0.30	150	2.5	2.5	2.5	3.0	3.0
141 - 200	0.25 - 0.29	125	1.5	1.5	2.0	2.0	2.0
105 - 140	0.21 - 0.28	100	1	1.0	1.5	1.5	1.5
40 - 60	0.21 - 0.27	75	0.5	0.5	1.0	1.0	1.0
< 40	0.20 - 0.26	75	0.5	1.0	1.0	1.0	1.5

- GENERAL NOTES:
1. FOR PIPING SMALLER THAN 1-1/2 INCH (38mm) AND LOCATED IN PARTITIONS WITHIN CONDITIONED SPACES, REDUCTION OF THESE THICKNESSES BY 1 INCH (25mm) SHALL BE PERMITTED (BEFORE THICKNESSES REQUIRED IN FOOTNOTE b) NOT TO A THICKNESS LESS THAN 1 INCH (25mm).
 2. FOR INSULATION OUTSIDE THE STATED CONDUCTIVITY RANGE, THE MINIMUM THICKNESS (T) SHALL BE DETERMINED AS FOLLOWS:
 $T = r \{ (1 + t/r)^k - 1 \}$
 WHERE:
 T = MINIMUM INSULATION THICKNESS,
 r = ACTUAL OUTSIDE RADIUS OF PIPE,
 t = INSULATION THICKNESS LISTED IN THE TABLE FOR APPLICABLE FLUID TEMPERATURE AND PIPE SIZE.
 K = CONDUCTIVITY OF ALTERNATE MATERIAL AT MEAN RATING TEMPERATURE INDICATED FOR THE APPLICABLE FLUID TEMPERATURE (Btu · in/h · ft² x °F)
 k = THE UPPER VALUE OF THE CONDUCTIVITY RANGE LISTED IN THE TABLE FOR THE APPLICABLE FLUID TEMPERATURE.
 3. FOR DIRECT-BURIED HEATING AND HOT WATER SYSTEM PIPING, REDUCTION OF THESE THICKNESSES BY 1-1/2 INCHES (38mm) SHALL BE PERMITTED (BEFORE THICKNESS ADJUSTMENT REQUIRED IN FOOTNOTE b) BY BUT NOT TO THICKNESS LESS THAN 1 INCH (25mm)



REVISIONS	CHANGE
DATE	PERMIT SET
03/23/2022	GAS PIPING REVISION
05/20/2022	NG PIPING REVISION DOAS DUCT RELOCATION
07/25/2022	

DRAWN	RPG
DESIGN	BSM
DATE	03/23/2022
APPROVED	

CASCADE CHRISTIAN JUNIOR HIGH
 SCHEDULES II
 815 21ST STREET SE
 PUYALLUP, WASHINGTON 98372

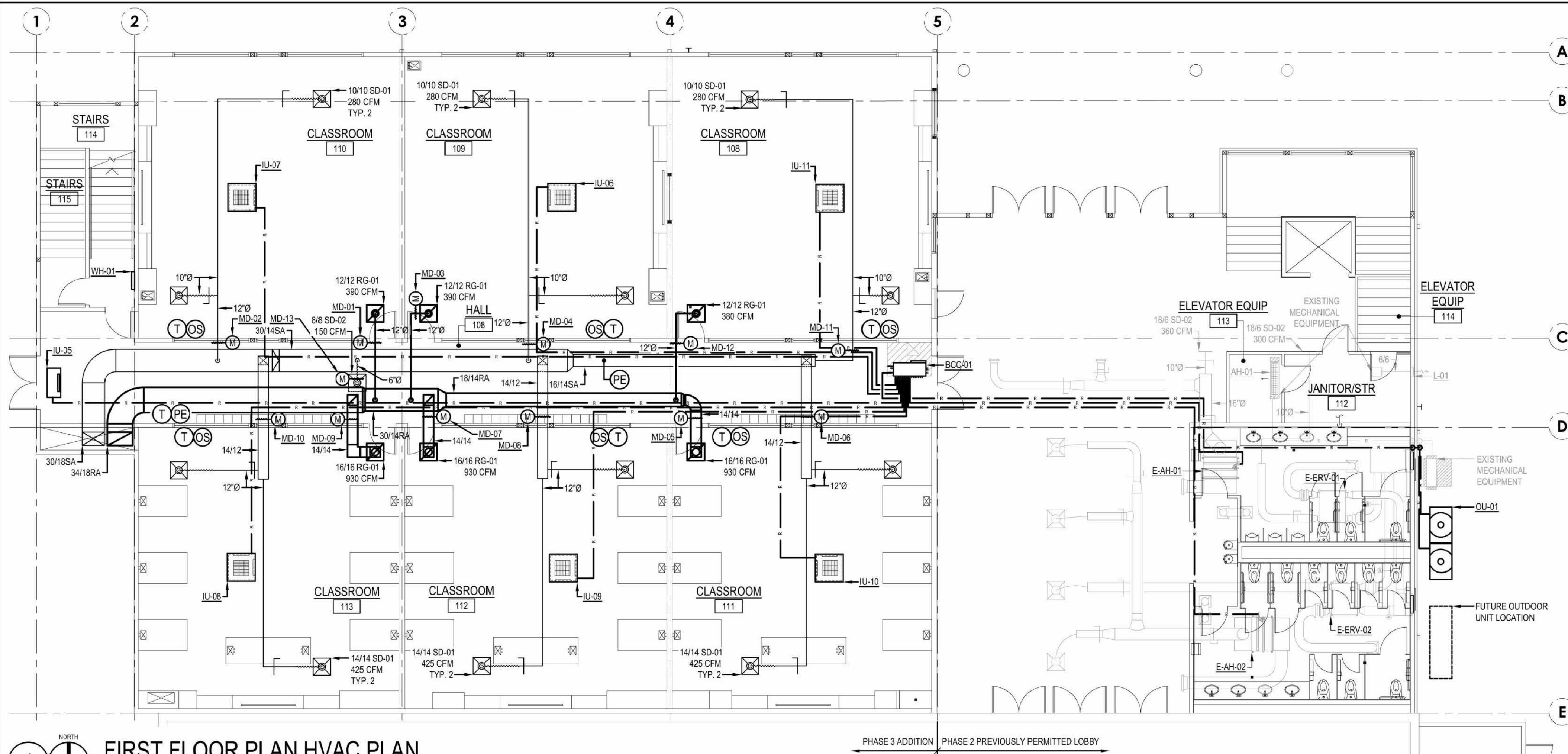
Air Systems Engineering Inc.
 COMFORT SYSTEMS USA
 AIR CONDITIONING, DESIGN & INSTALLATION
 (253) 876-9884
 3002 SOUTH PARKWAY, PUYALLUP, WA 98460
 AIR CONDITIONING/SHEET METAL/REFRIGERATION/PROFESSIONAL ENGINEERS/SERVICE & MAINTENANCE

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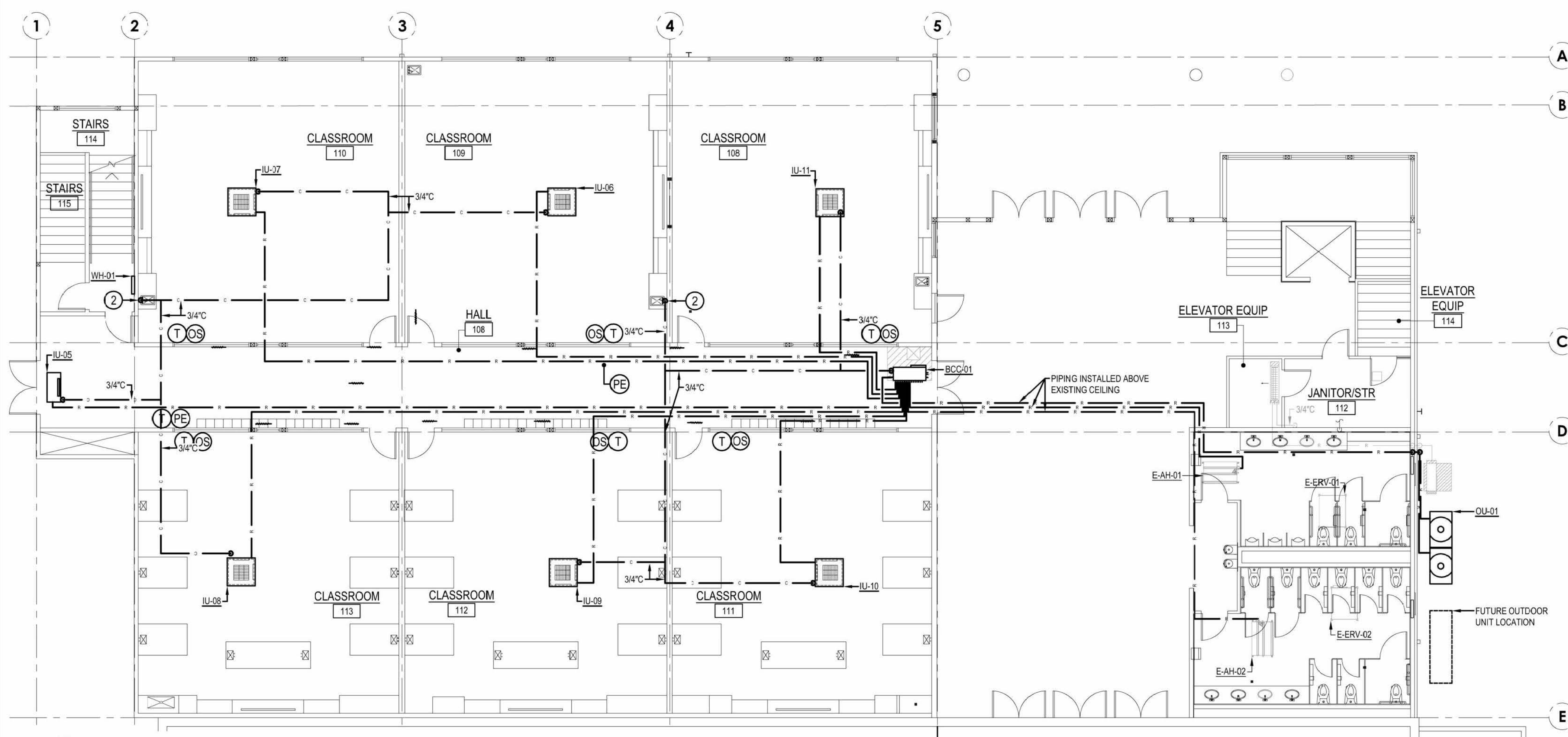
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SHEET NO. M3 OF 9
 JOB NO. 4126



1 NORTH
FIRST FLOOR PLAN HVAC PLAN
 SCALE: 1/8" = 1'-0"



2 NORTH
FIRST FLOOR PLAN PIPING PLAN
 SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. LINES AND EQUIPMENT SHOWN DARK IS NEW WORK. LINES AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN.
2. OCCUPANCY SENSORS SHALL BE WATT STOPPER CI-24.

1. INSTALL DUCT PRESSURE SENSOR IN SUPPLY AIR DUCT IN THIS APPROXIMATE LOCATION.
2. ROUTE 3/4" CONDENSATE DOWN WALL TO SINK TAIL PIECE. TAIL PIECE PROVIDED BY PLUMBING CONTRACTOR.
3. PROVIDE BRAIDED COPPER FLEXIBLE CONNECTOR, R410 RATED, 650 PSI MAXIMUM WORKING PRESSURE, PARKING INDUSTRIES OR EQUAL.
4. CONNECTED REFRIGERANT TO EXISTING MECHANICAL EQUIPMENT.
5. 3/4" TO WATER HEATERS. SEE PLUMBING FOR MORE INFORMATION.



REVISIONS	CHANGE
DATE	PERMIT SET
03/23/2022	GAS PIPING REVISION
05/20/2022	NG PIPING REVISION DOAS DUCT RELOCATION
07/25/2022	

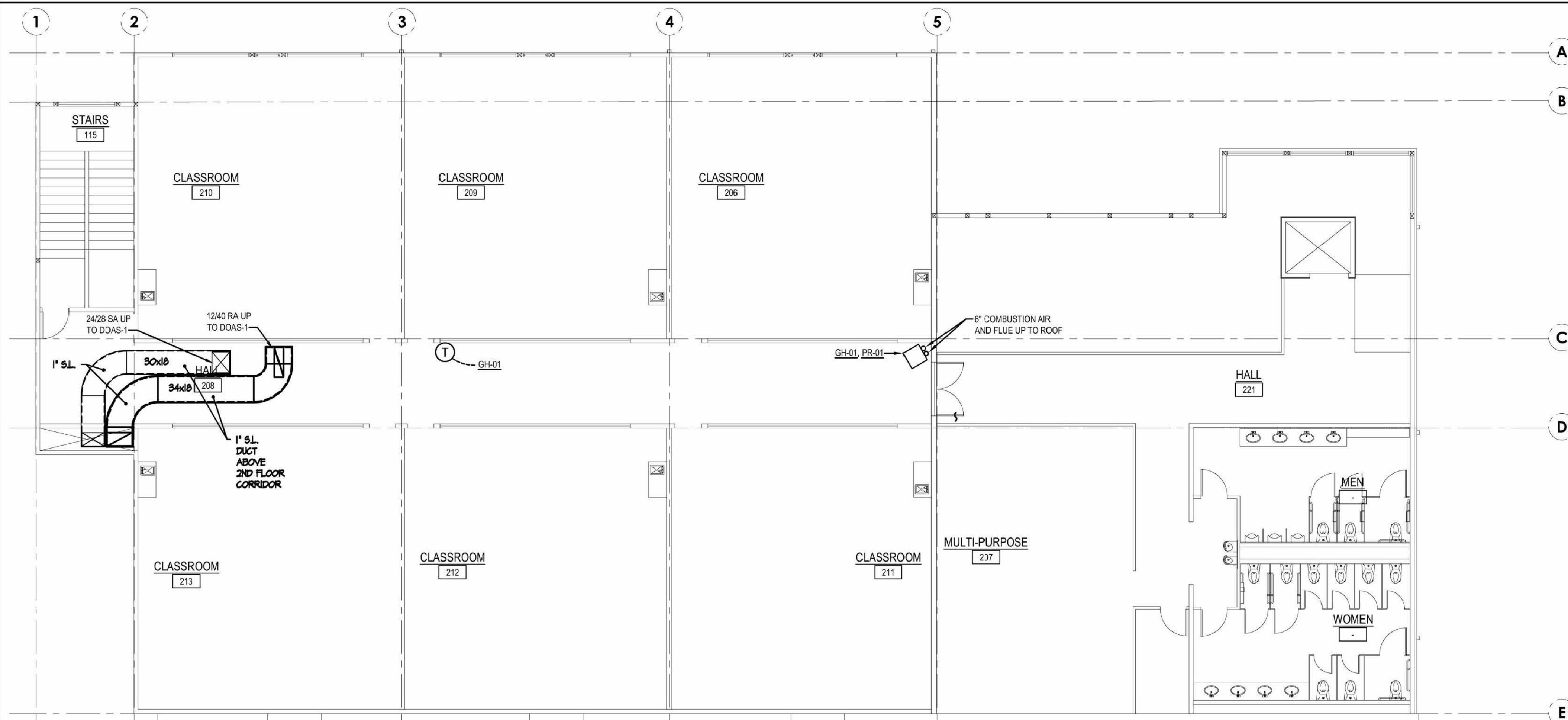
CASCADE CHRISTIAN JUNIOR HIGH
 FIRST FLOOR PLAN
 815 21ST STREET SE
 PUYALLUP, WASHINGTON 98372

AIR SYSTEMS
 Engineering Inc.
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 AIR CONDITIONING / SHEET METAL / REFRIGERATION / PROFESSIONAL ENGINEERS / SERVICE & MAINTENANCE
 (253) 576-9884
 3002 SOUTH PINE / PUYALLUP, WA 98460

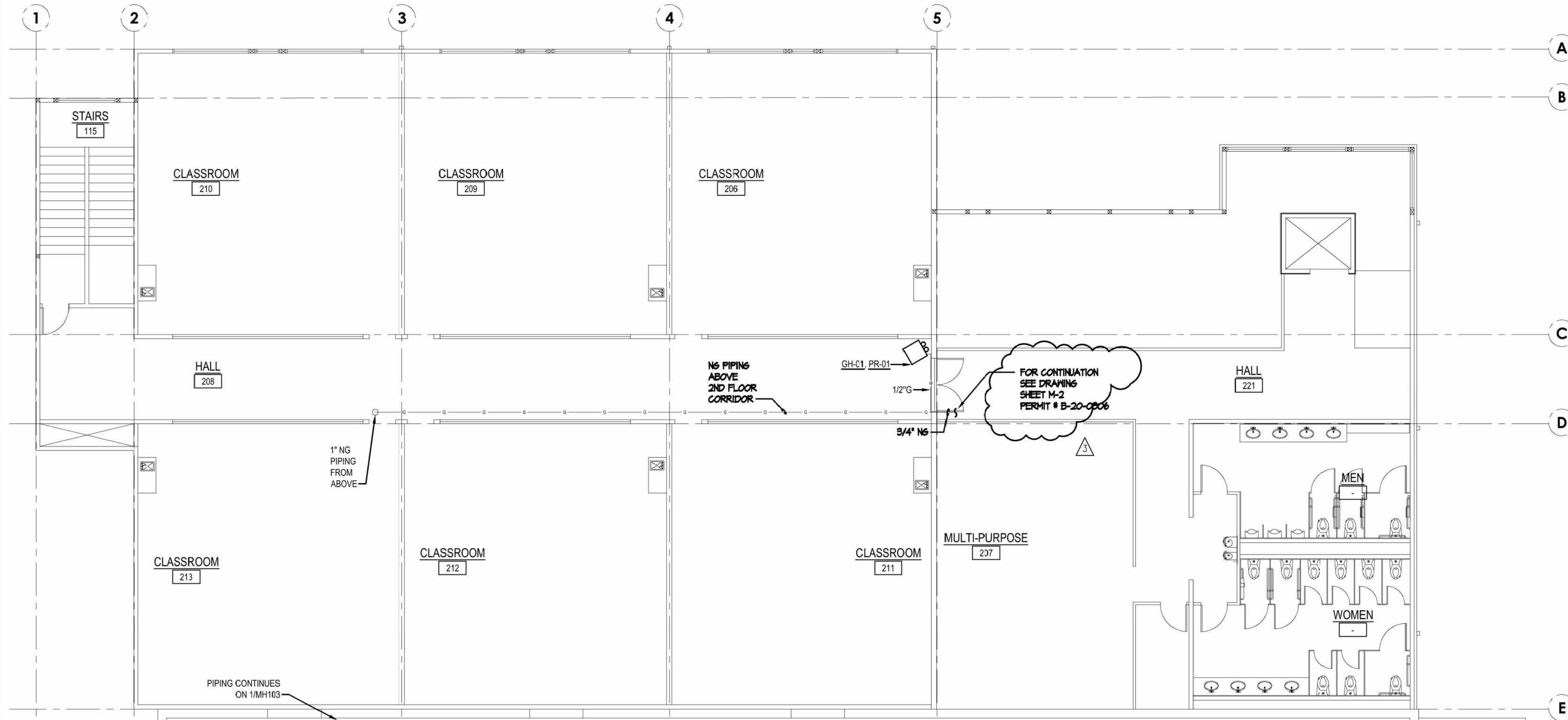
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B-21-0727



1 NORTH
SECOND FLOOR HVAC PLAN
 SCALE: 1/8" = 1'-0"



2 NORTH
SECOND FLOOR PLAN PIPING PLAN
 SCALE: 1/8" = 1'-0"

GENERAL NOTES

1. LINES AND EQUIPMENT SHOWN DARK IS NEW WORK. LINES AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN.
2. OCCUPANCY SENSORS SHALL BE WATT STOPPER CI-24.



REVISIONS	CHANGE
DATE	PERMIT SET
03/23/2022	GAS PIPING REVISION
05/20/2022	NG PIPING REVISION DOAS DUCT RELOCATION
07/25/2022	
DRAWN	APPROVED
RFG	
DESIGN	
BSM	
DATE	
03/23/2022	

CASCADE CHRISTIAN JUNIOR HIGH
 SECOND FLOOR PLAN
 815 21ST STREET SE
 PUYALLUP, WASHINGTON 98372

SEE NEXT PAGE (M-2 FROM PERMIT # B-20-0306) TO SEE GAS PIPING CONNECTION BETWEEN CLASSROOMS AND LOBBY

City of Puyallup
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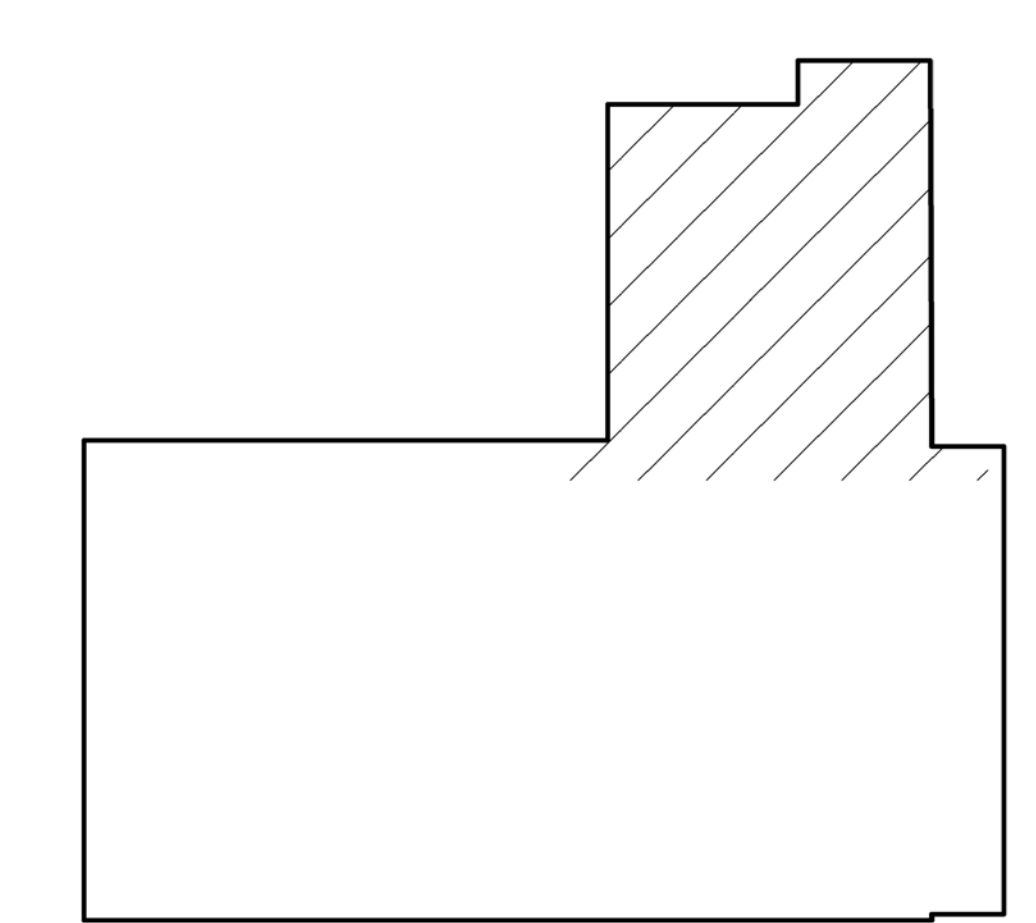
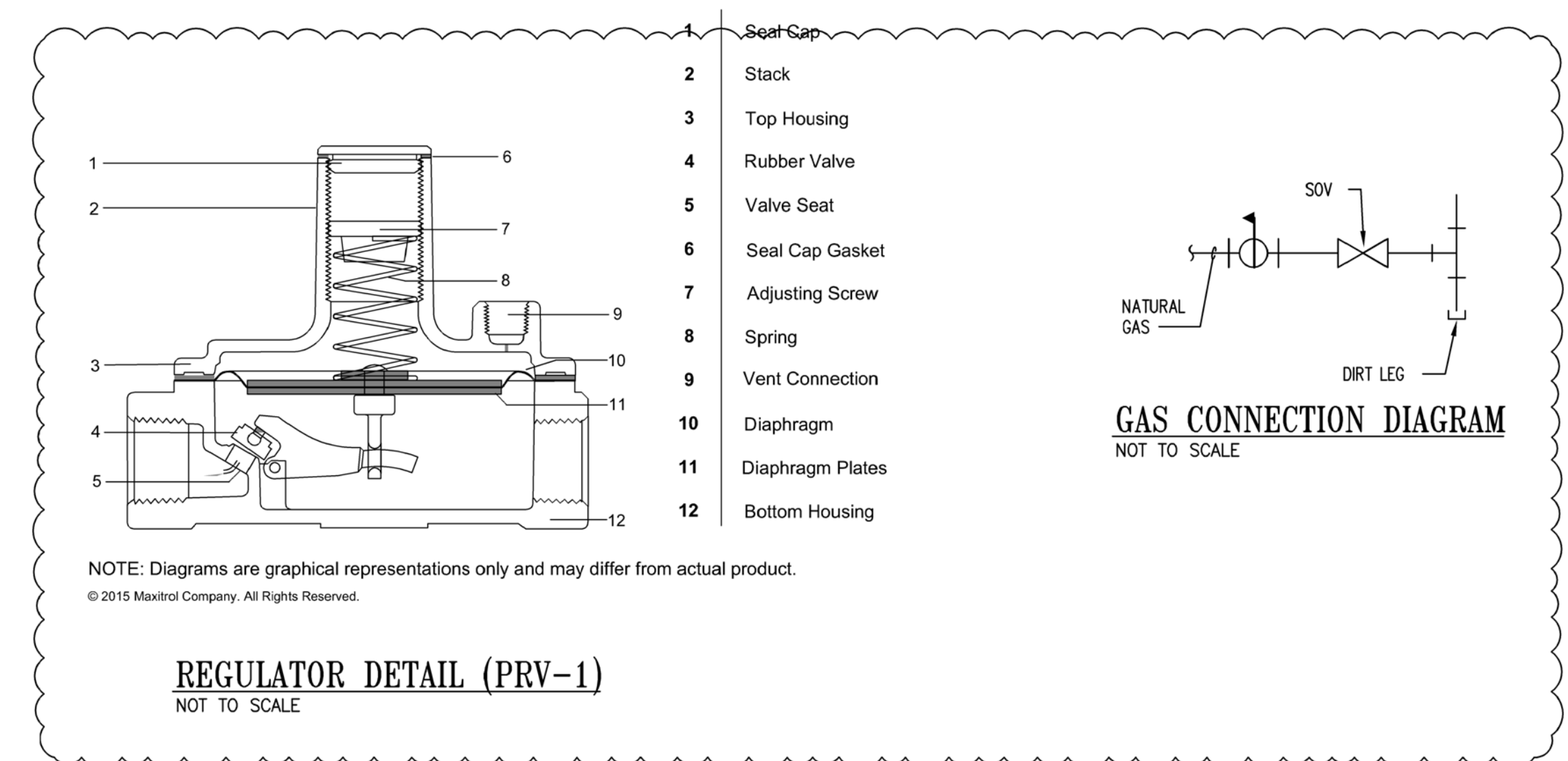
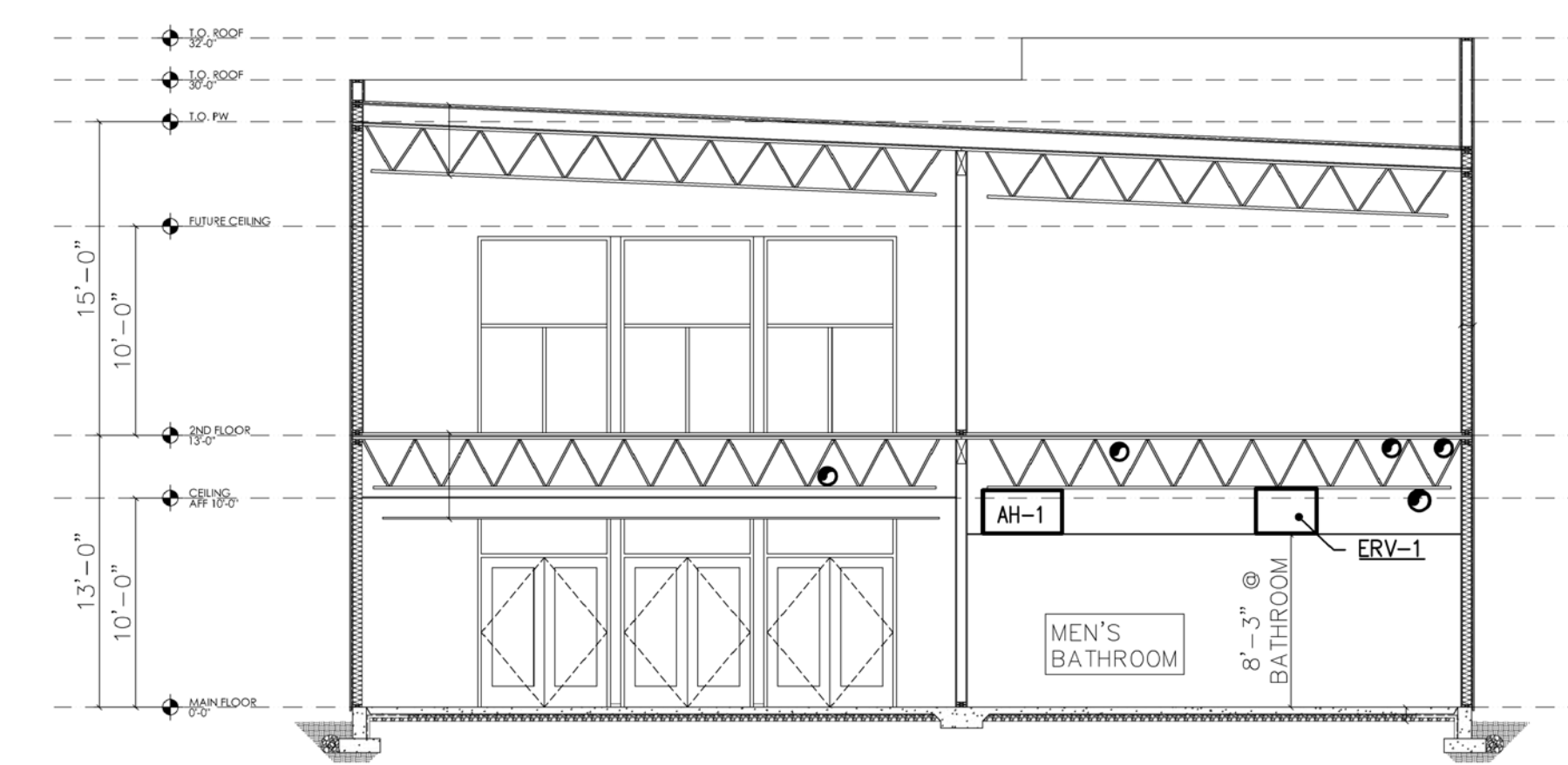
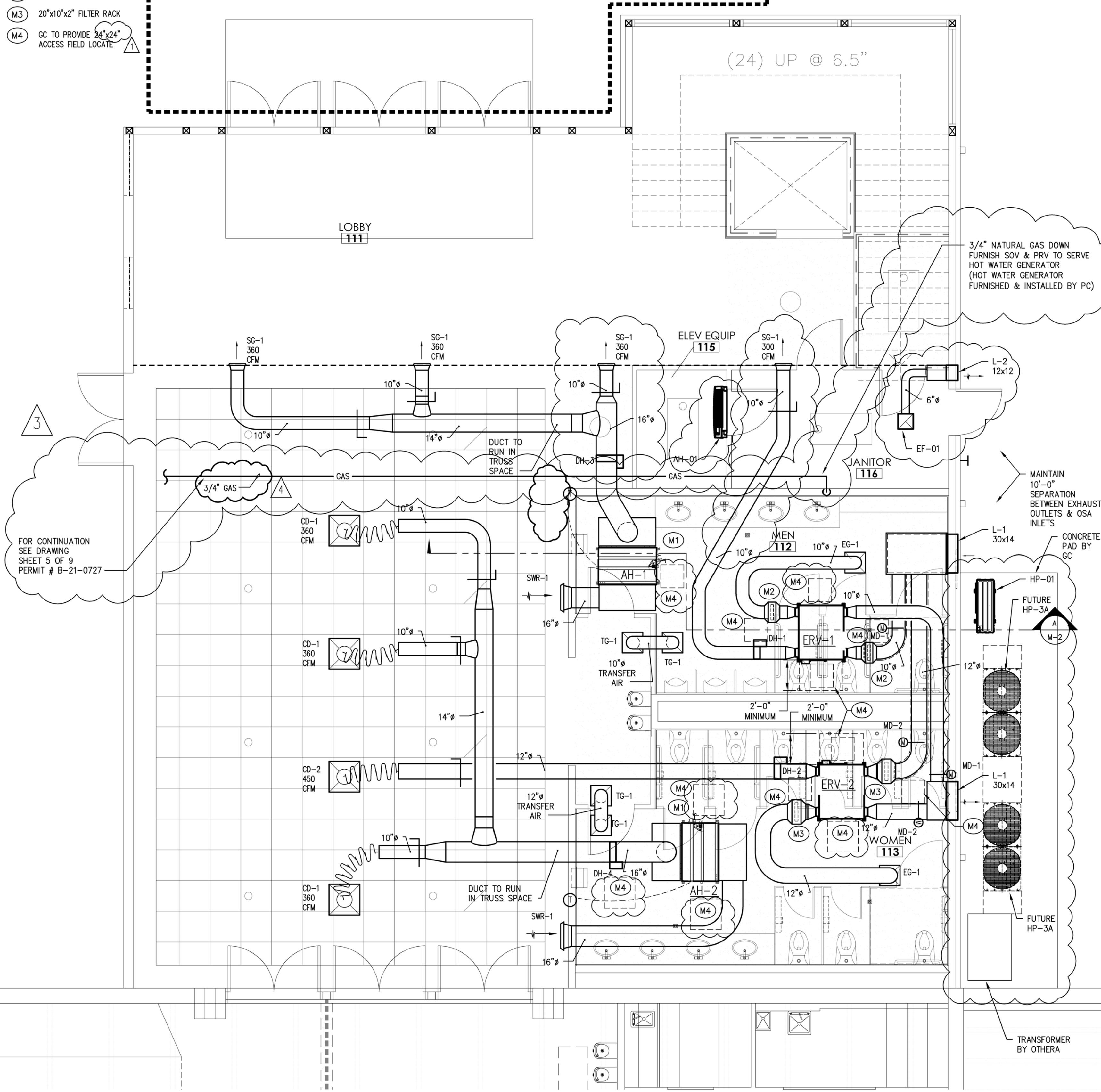
SHEET NO. **M5** OF **9**
 JOB NO. **4126**



REFERENCE ONLY (FROM PERMIT # B-20-0306)

TO SHOW GAS PIPING CONNECTION BETWEEN CLASSROOM & LOBBY

- KEY NOTE**
- M1 ROUTE CONDENSATE LINE TO NEAREST DRAIN PROVIDED BY PLUMBING CONTRACTOR
 - M2 12"x12"x2" FILTER RACK
 - M3 20"x10"x2" FILTER RACK
 - M4 GC TO PROVIDE 24"x24" ACCESS FIELD LOCATE



REVISIONS	CHANGE	DATE	APPROVED
PERMIT SET		APRIL 29, 2020	JL
ACCESS		OCTOBER 6, 2020	JL
LOBBY REVISION		NOVEMBER 2, 2021	JL
GAS PIPE REVISION		MAY 20, 2022	JL
NATURAL GAS PIPE REVISION		JULY 21, 2022	JL

CASCADE CHRISTIAN SCHOOL
JR HIGH SCHOOL GYM LOBBY ADDITION
MAIN FLOOR HVAC PLAN & BUILDING SECTION

815 21ST ST SE
 PUYALLUP, WA 98372

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 AIR CONDITIONING, DESIGN & INSTALLATION
 (253) 575-9884
 3802 SOUTH PINE/FACOML WA 98469
 AIR CONDITIONING/SHEET METAL/REFRIGERATION/PROFESSIONAL ENGINEERS/SERVICE & MAINTENANCE

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Engineering	Public Works
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MAIN FLOOR HVAC PLAN
 1/4"=1'-0"

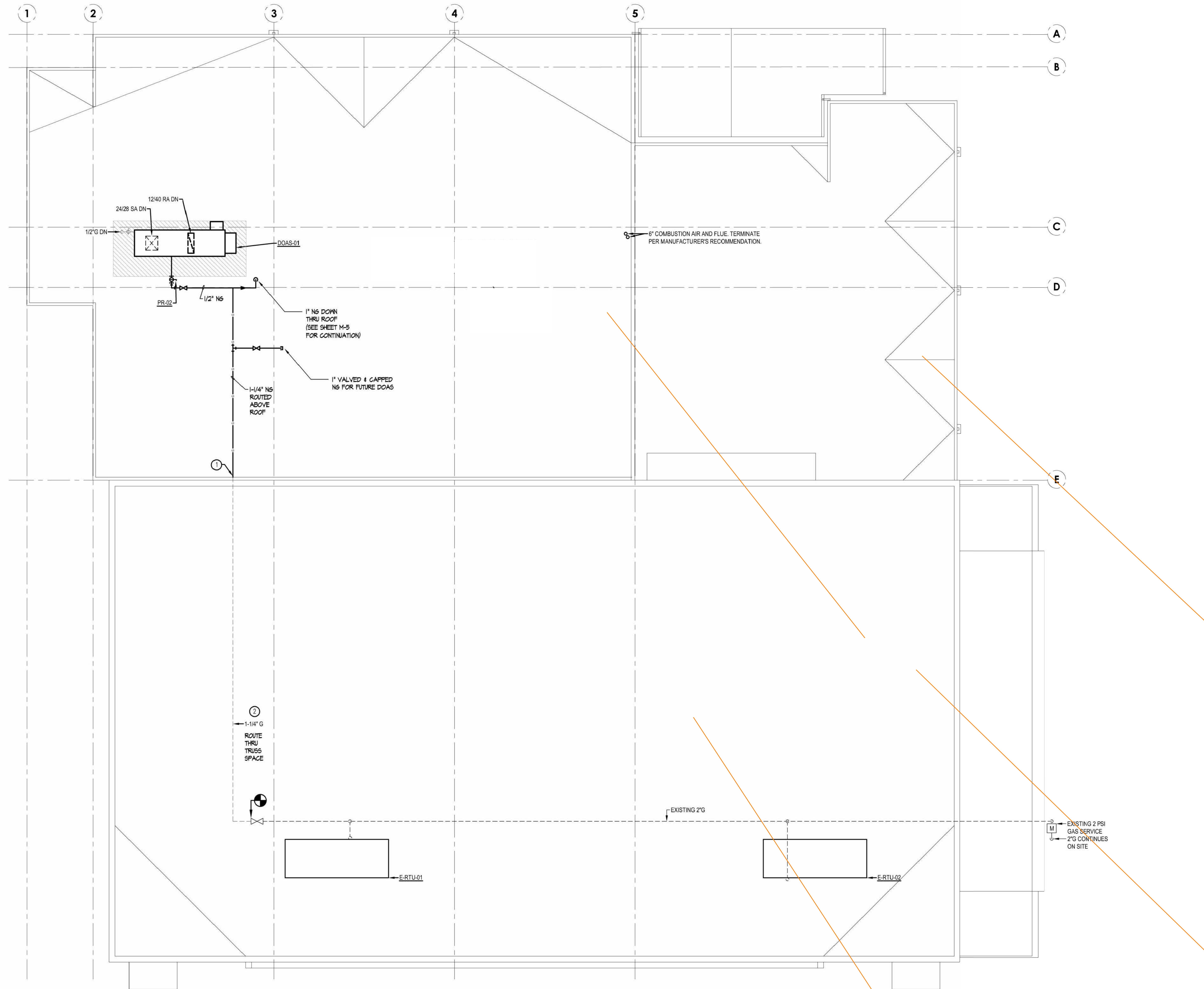
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SHEET NO. **M-2** OF **2**
 JOB NO. **4126**



GENERAL NOTES

1. LINES AND EQUIPMENT SHOWN DARK IS NEW WORK. LINES AND EQUIPMENT SHOWN LIGHT IS EXISTING TO REMAIN.
 2. OCCUPANCY SENSORS SHALL BE WATT STOPPER CI-24.
- ① CORE DRILL THROUGH EXISTING MASONRY WALL.
 - ② ROUTE PIPING BETWEEN JOISTS, CLOSE TO CEILING STRUCTURE.

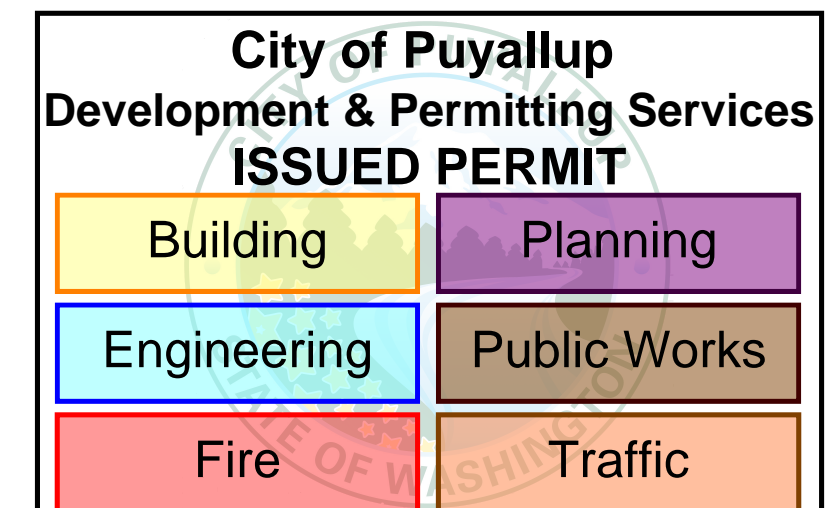


REVISIONS		CHANGE
DATE	03/23/2022	PERMIT SET
DATE	05/20/2022	GAS PIPING REVISION
DATE	07/25/2022	NG PIPING REVISION DOAS DUCT RELOCATION

DRAWN	RFG	DESIGN	HSM	DATE	APPROVED
				03/23/2022	

CASCADE CHRISTIAN JUNIOR HIGH
 ROOF PLAN
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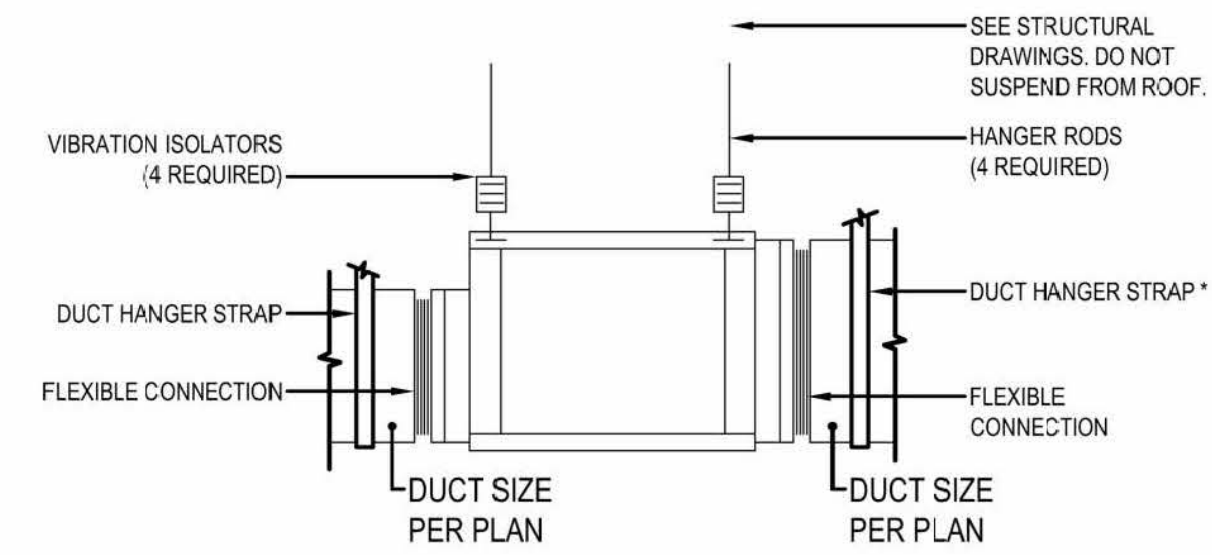


1 NORTH
ROOF PLAN
 SCALE: 1/8" = 1'-0"

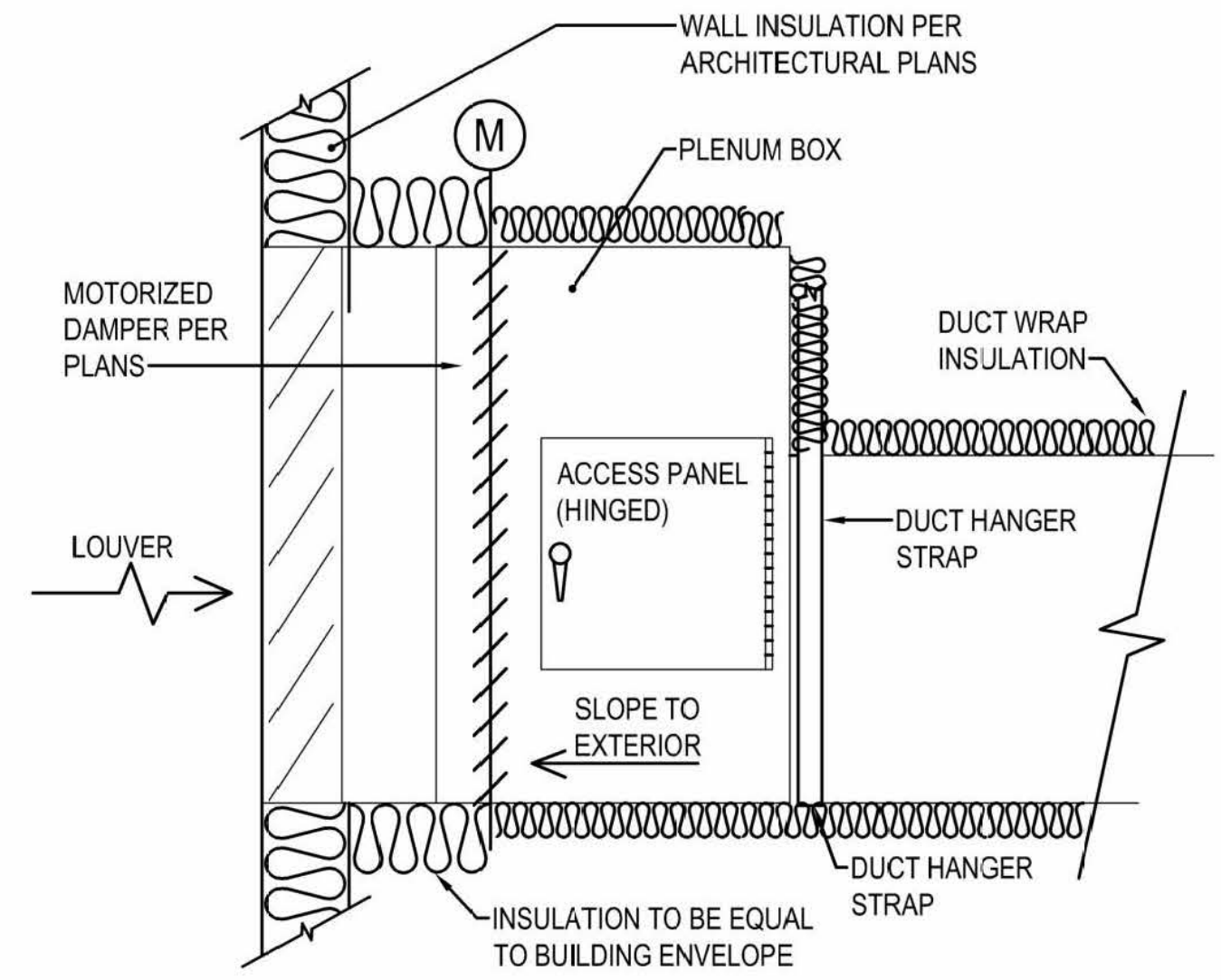
6 M7 7 M7 8 M7 9 M8

B-21-0727

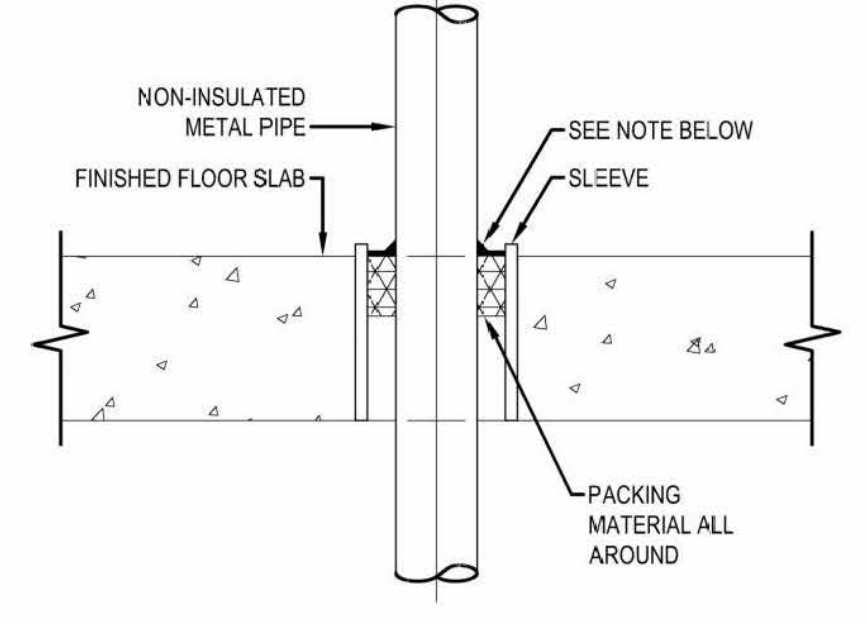
SHEET NO. **M6** OF **9**
 JOB NO. **4126**



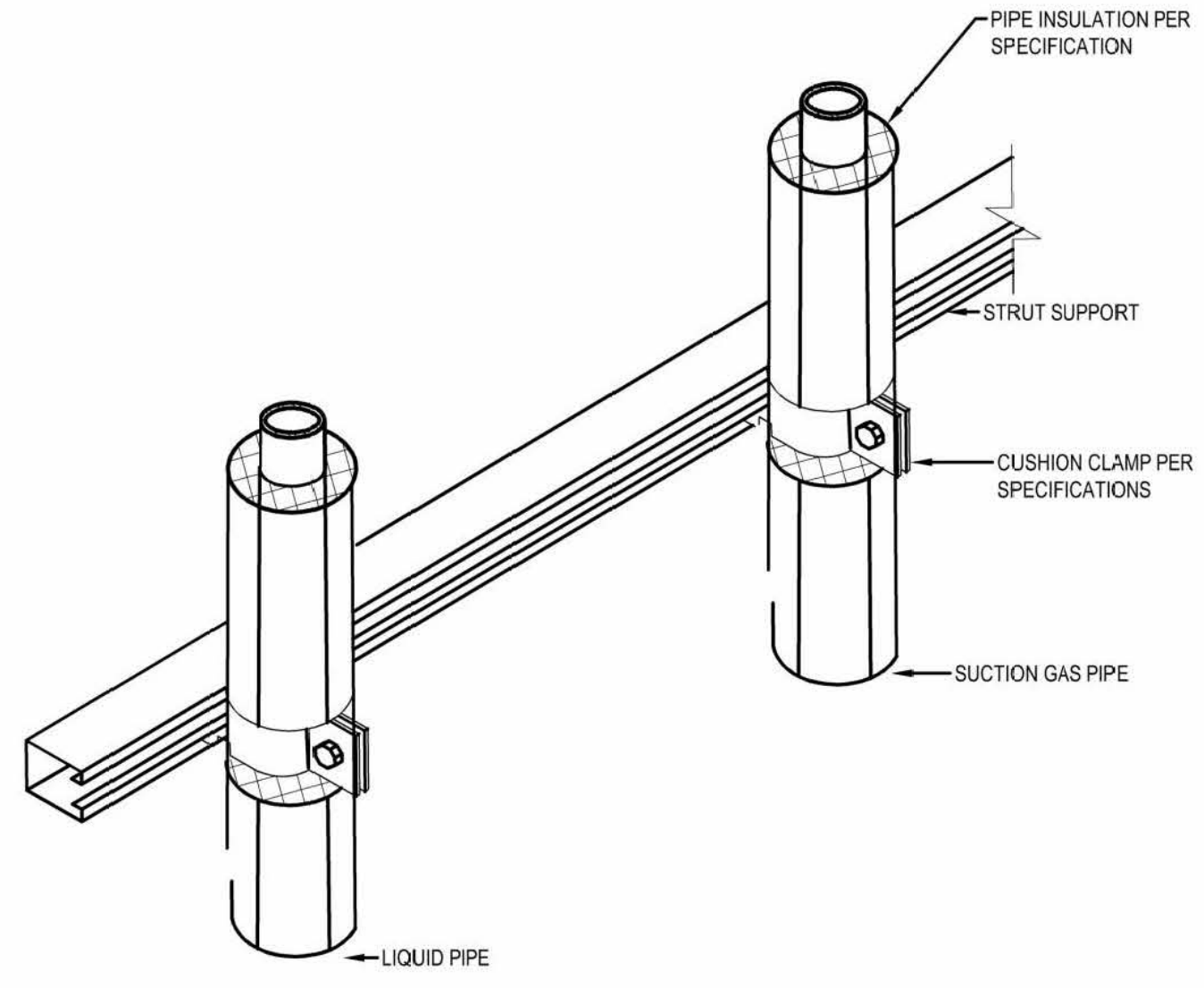
1 INLINE EXHAUST FAN DETAIL
SCALE: NTS



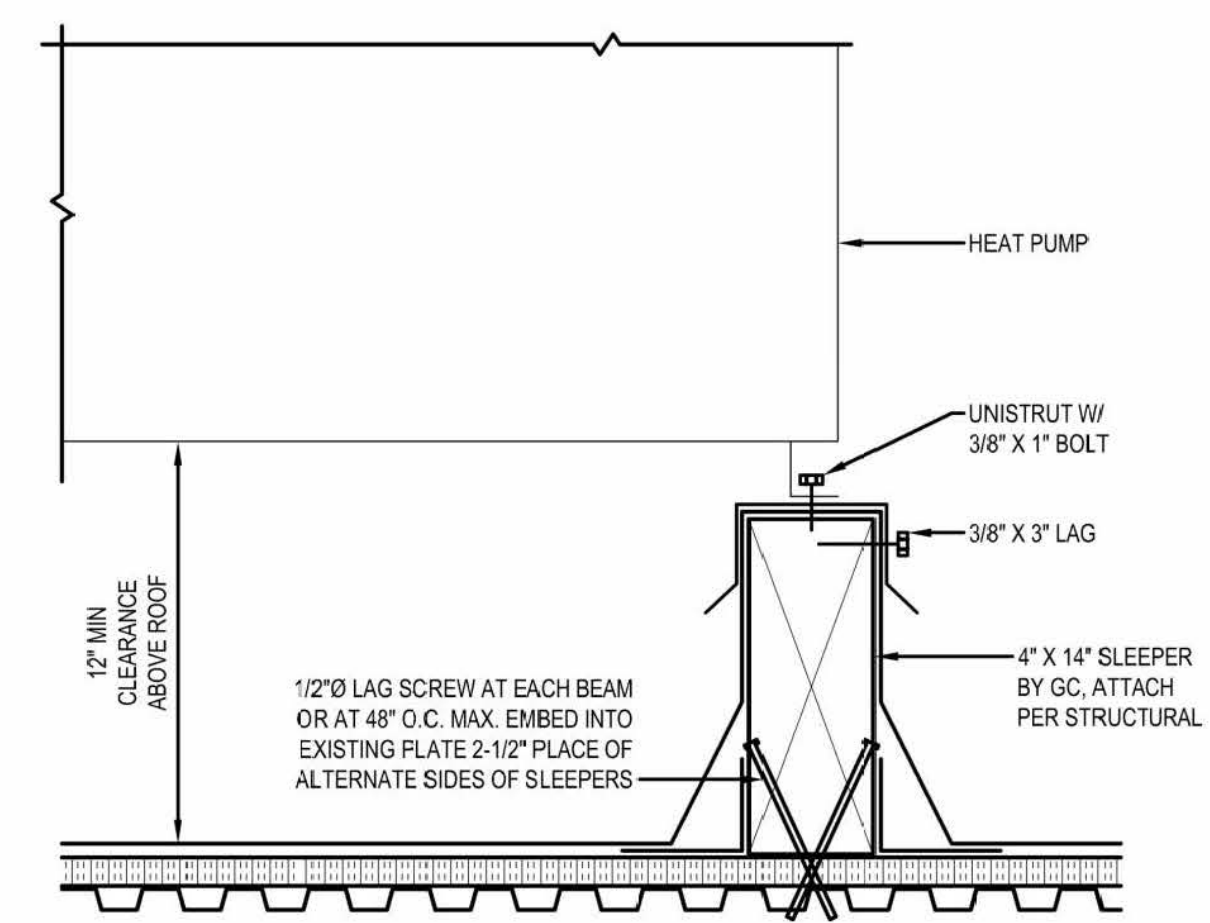
2 DUCT AT LOUVER INSTALLATION DETAIL
SCALE: NTS



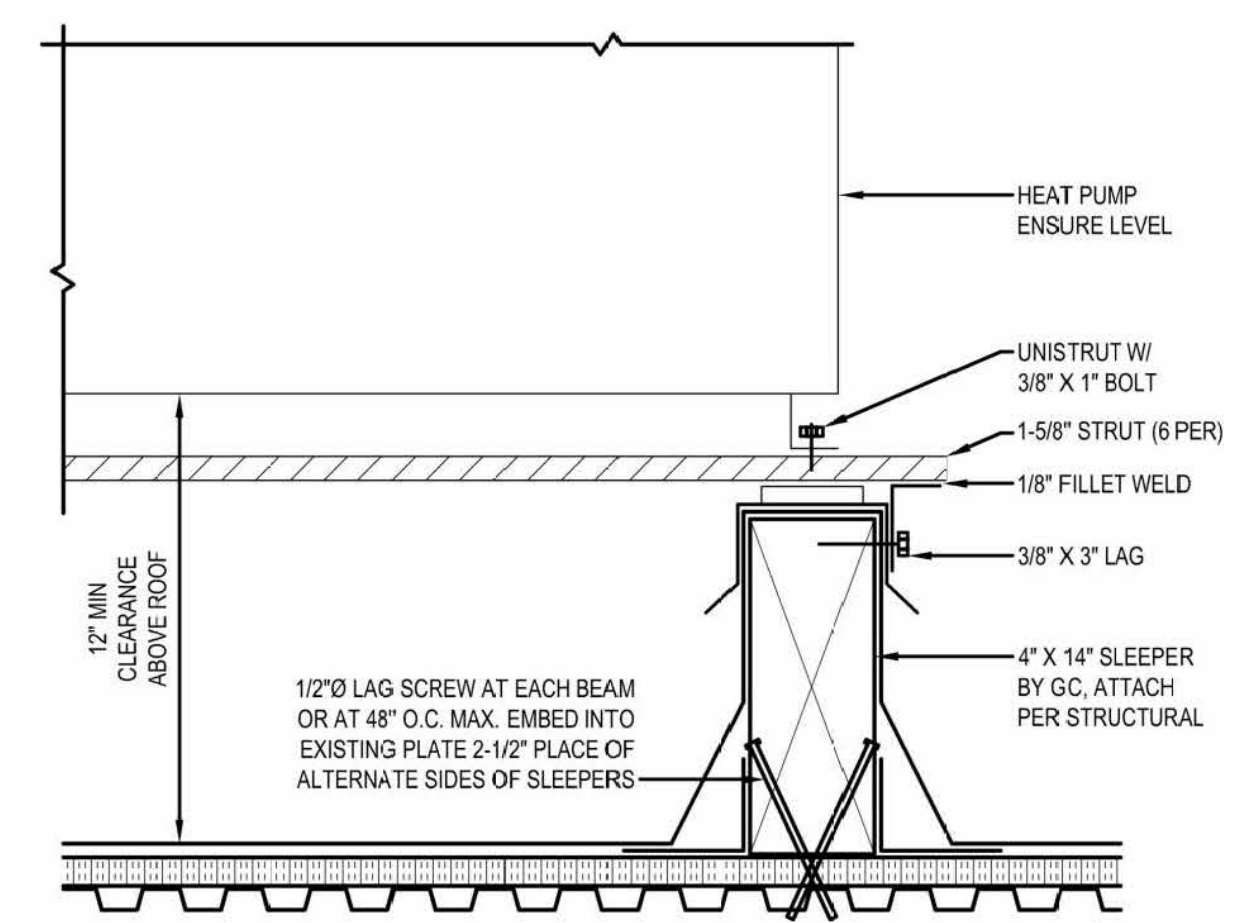
3 FIRE STOPPING AT FLOOR
SCALE: NTS



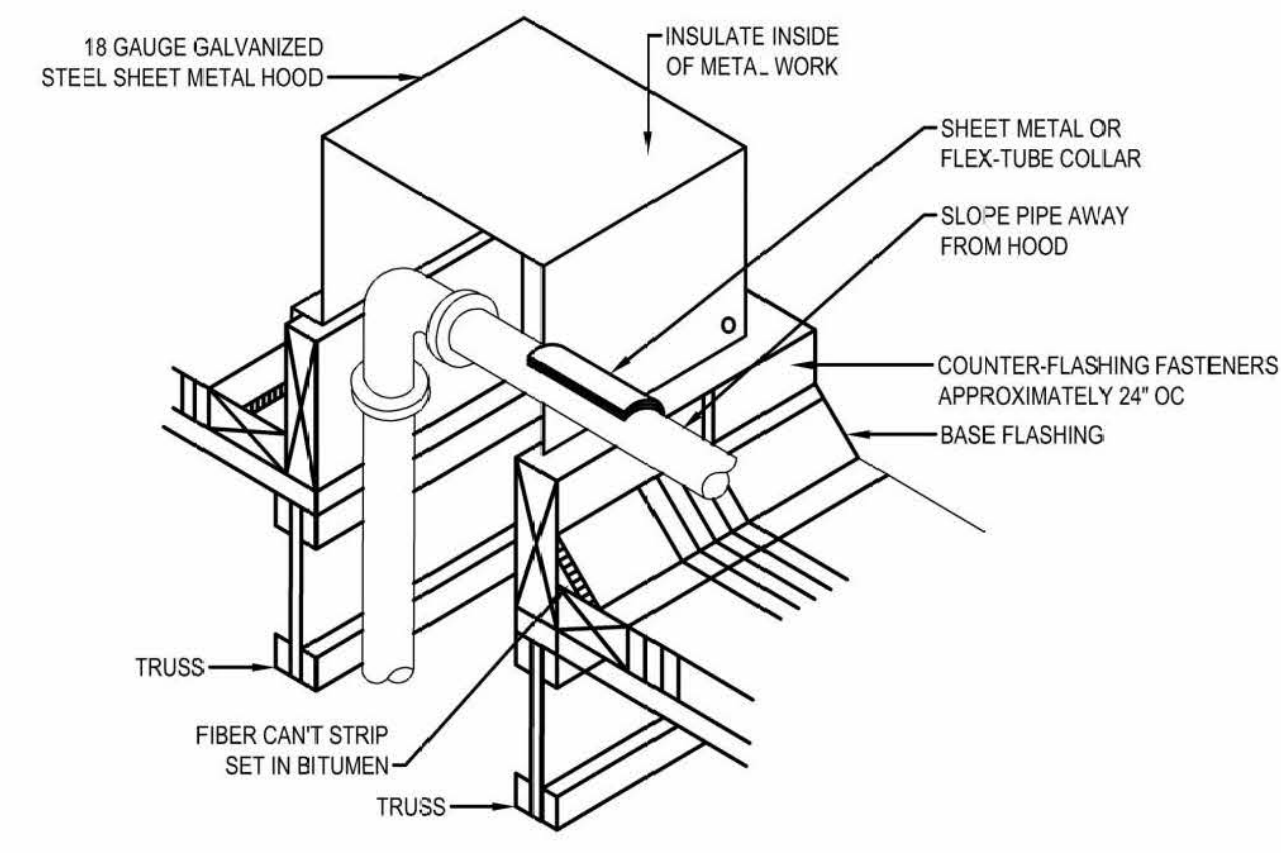
4 VERTICAL REFRIGERANT PIPE SUPPORT DETAIL
SCALE: NTS



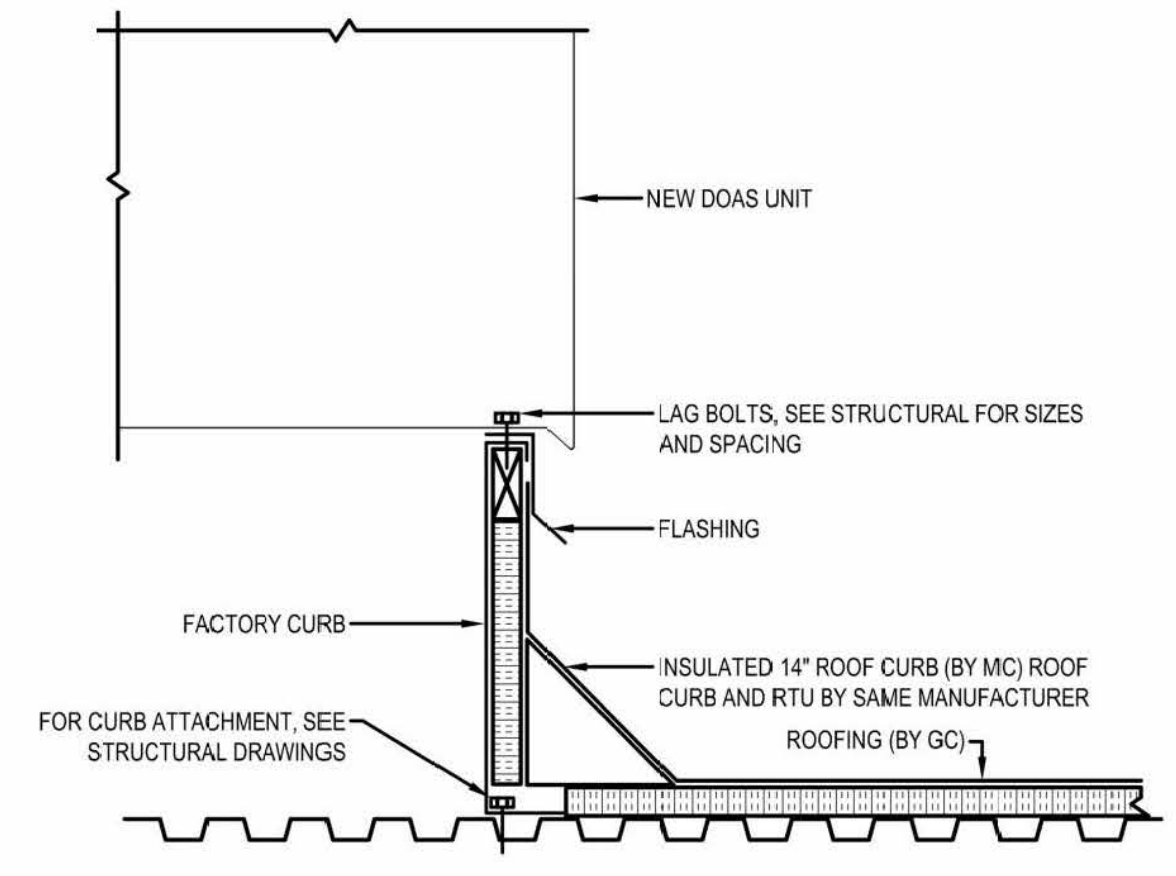
5 HEAT PUMP HP-1 SLEEPER DETAIL
SCALE: NTS



6 HEAT PUMP OU-01 SLEEPER DETAIL
SCALE: NTS



7 ROOFTOP PIPE PENETRATION DETAIL
SCALE: NTS



8 DOAS UNIT MOUNTING
SCALE: NTS

REVISIONS	CHANGE
DATE	PERMIT SET
03/23/2022	GAS PIPING REVISION
05/20/2022	NG PIPING REVISION DOAS DUCT RELOCATION
07/25/2022	

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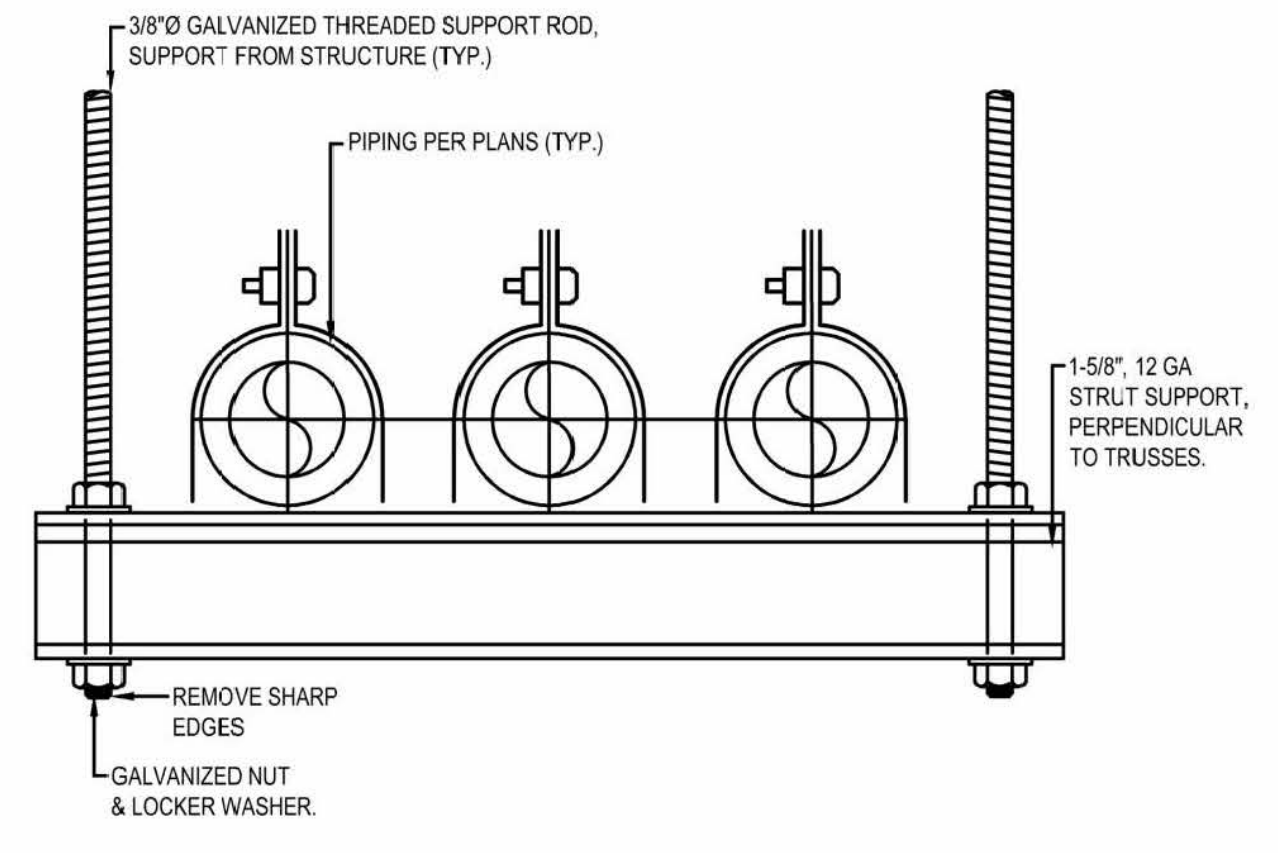
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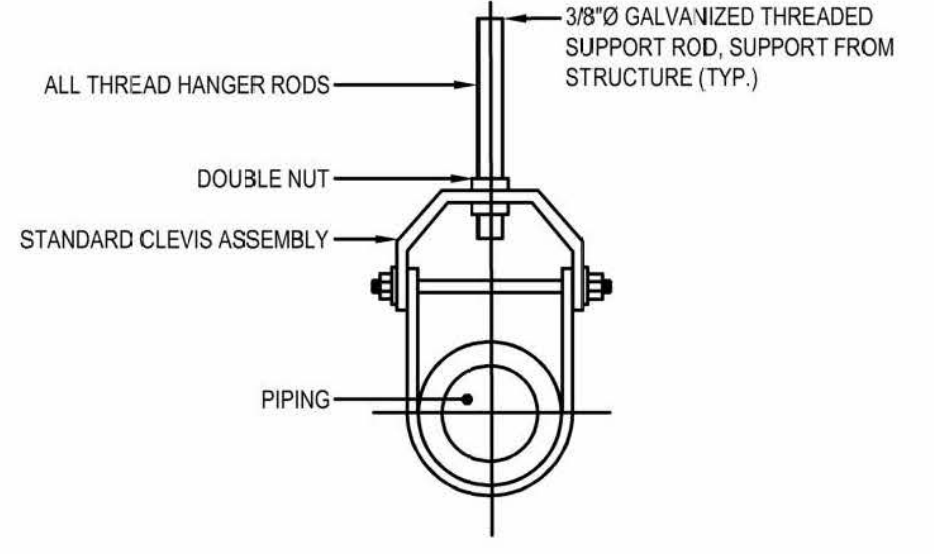
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SHEET NO. M7 OF 9
JOB NO. 4126

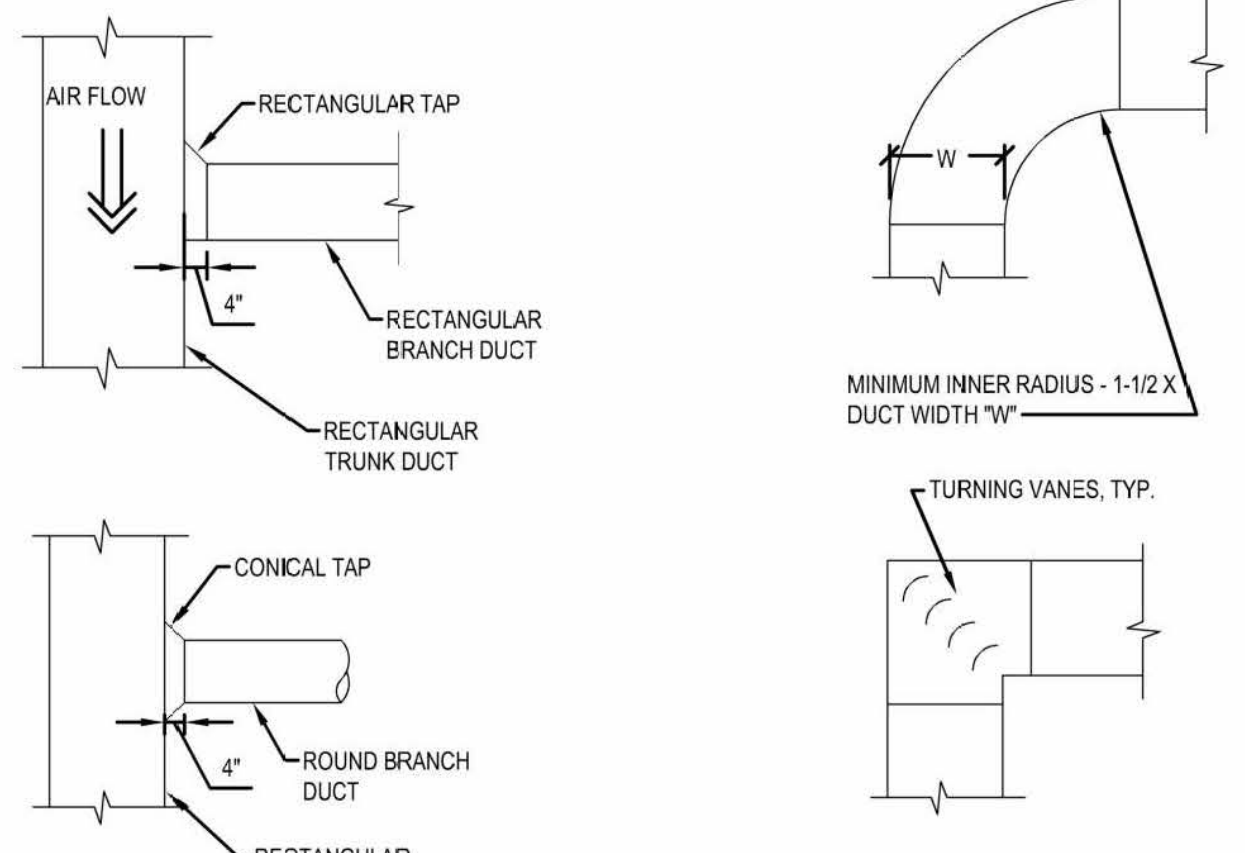


NOTE:
PROVIDE THREE SUPPORT RODS FOR STRUT LONGER THAN 24"

1 PIPE TRAPEZE DETAIL
SCALENTS

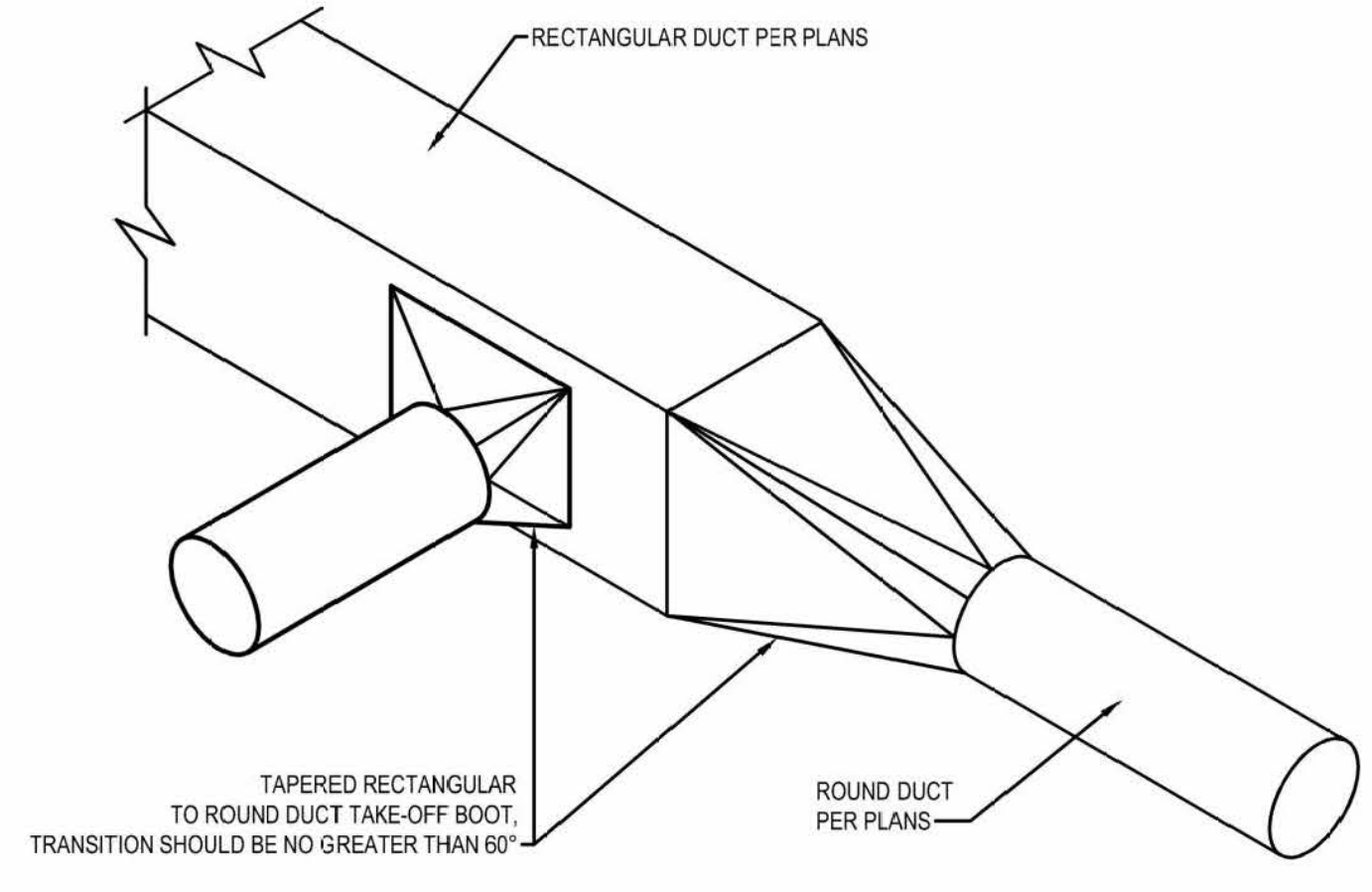


2 PIPE HANGER DETAIL
SCALENTS

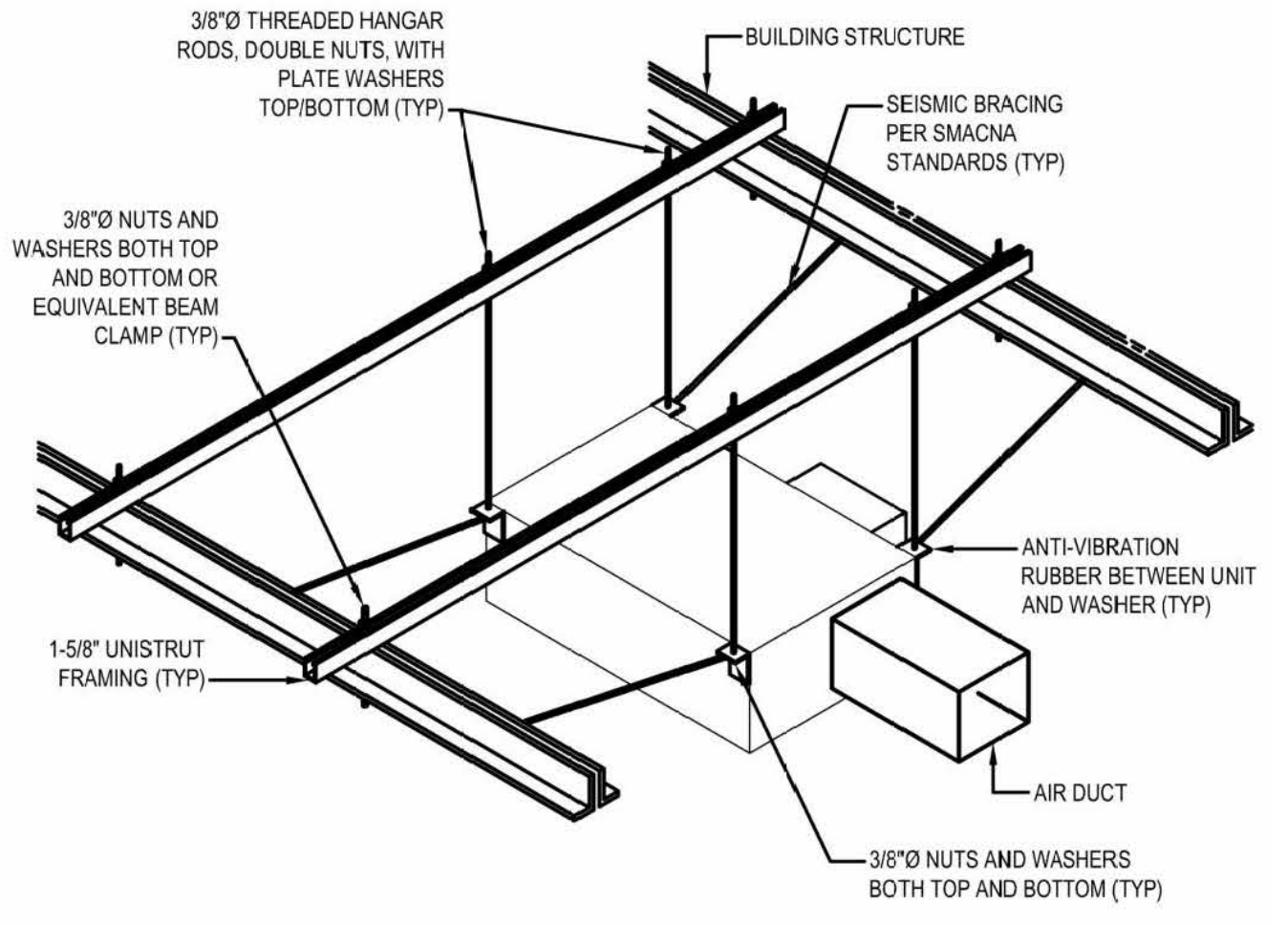


NOTE:
1. CONSTRUCT PER SMACNA DUCT CONSTRUCTION GUIDE, LATEST VERSION.

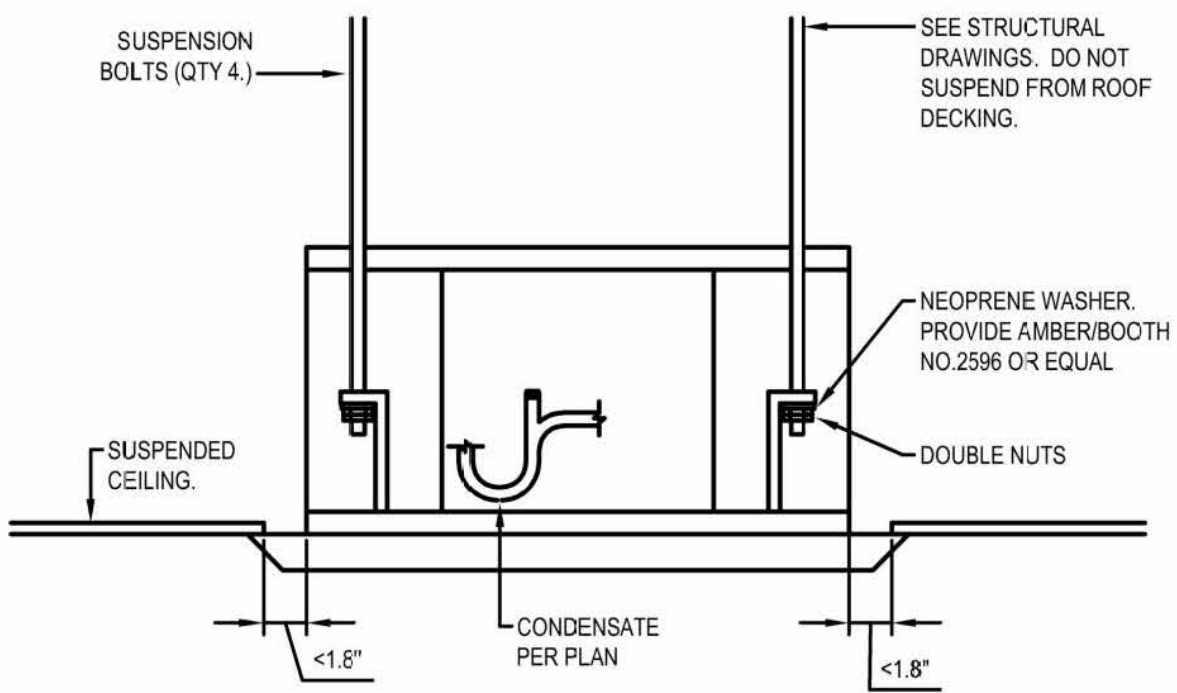
3 TYPICAL DUCT ELBOW AND DUCT TEE DETAILS
SCALENTS



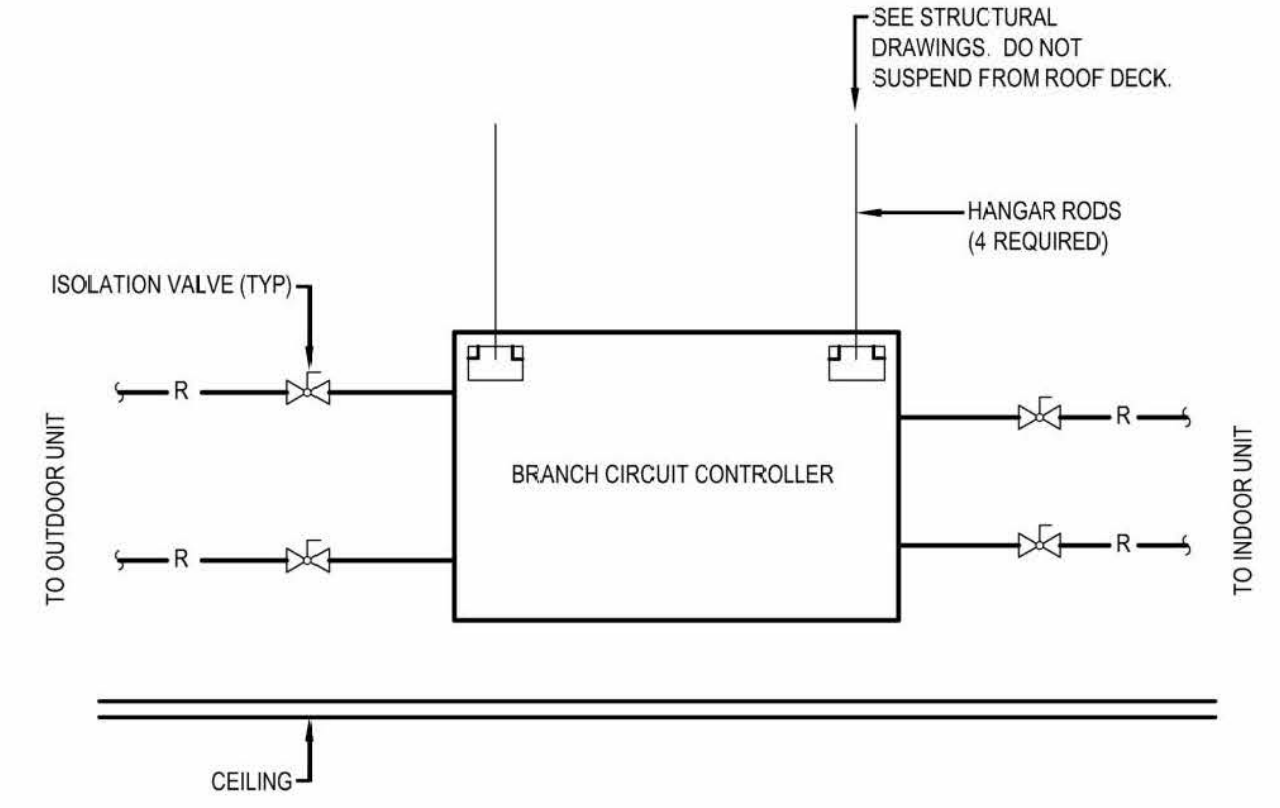
4 RECTANGULAR TO ROUND DUCT TRANSITION IN TYPICAL CONDENSED EQUIPMENT
SCALENTS



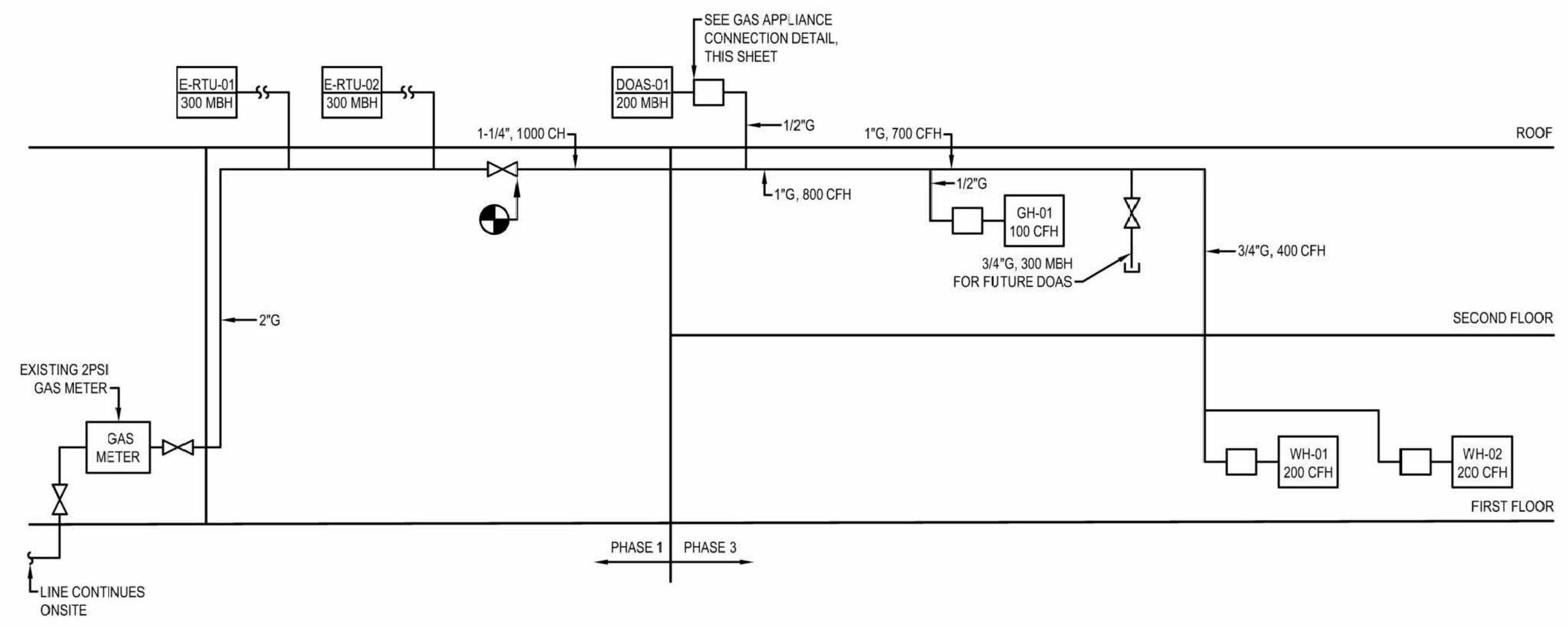
5 TYPICAL SUSPENDED EQUIPMENT
SCALENTS



6 INDOOR UNIT INSTALLATION DETAIL
SCALENTS

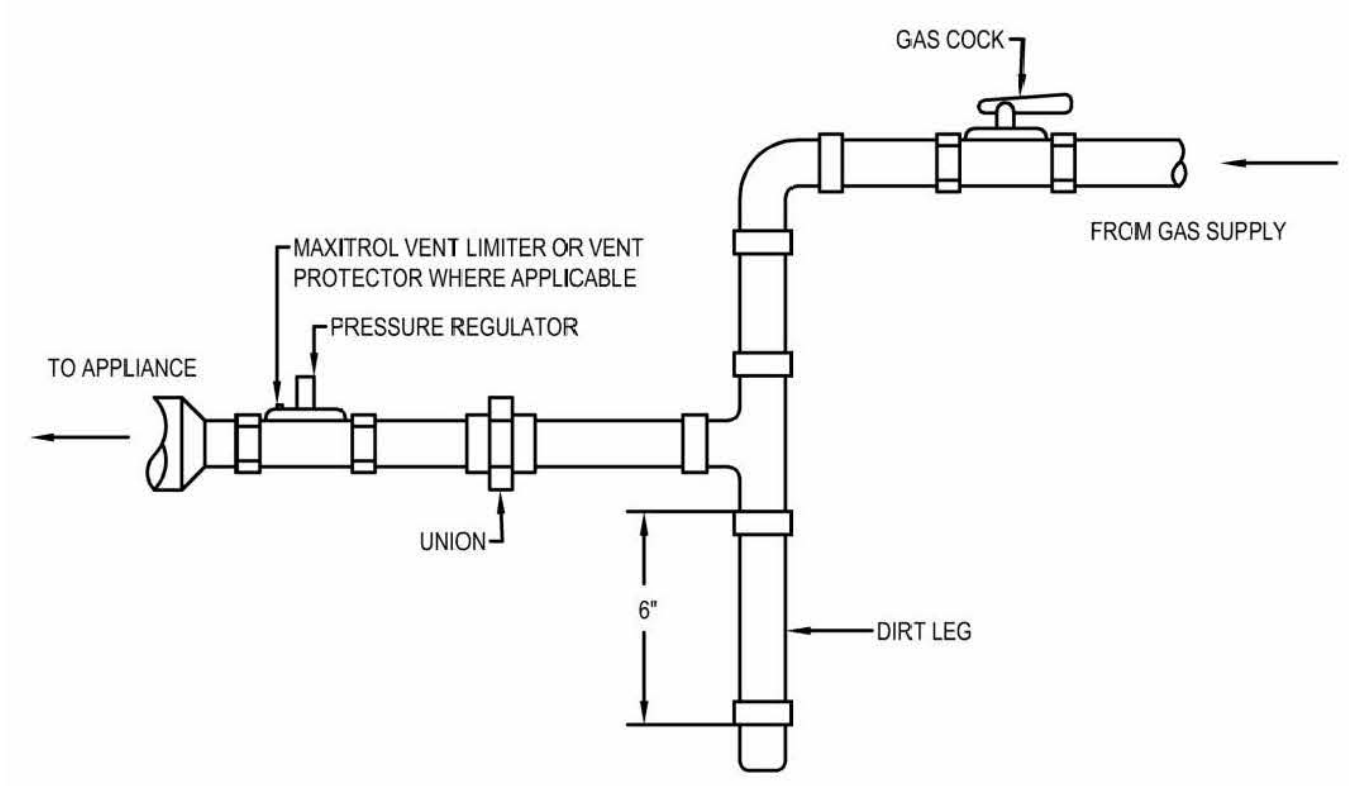


7 VRF BRANCH SELECTOR CONNECTION DETAIL
SCALENTS



NOTES:
1. GAS PIPING SIZED BASED ON TABLE 402.4(5) IFGC 2015, 2 PSI INLET PRESSURE USING THE LONGEST LENGTH METHOD.
2. GAS METER A SHALL ACCOMMODATE 1200 CFH OF NATURAL GAS THROUGH 400 LF.

8 GAS FLOW DIAGRAM
SCALENTS



NOTES:
1. INSTALL GAS CONNECTIONS PER MANUFACTURER'S RECOMMENDATION. REFER TO MECHANICAL DOCUMENTS AND CONSTRUCTION SUBMITTALS FOR MORE INFORMATION.
2. INSTALL TEST PLUGS WHERE APPROPRIATE PER MAXITROL INSTALLATION DIRECTIONS.

9 GAS APPLIANCE CONNECTION DETAIL
SCALENTS

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B-21-0727

SHEET NO. M8 OF 9
JOB NO. 4126

SEQUENCE OF OPERATIONS

- 1. TYPICAL SYSTEM SCHEDULE:**
- OFF HOURS ARE 6:00 PM TO 6:00 AM AND WEEKENDS, ADJUSTABLE.
 - MORNING WARM-UP IS TO BE STARTED AT AN "OPTIMAL START" TIME. OCCUPIED HOURS ARE 6:00 AM TO 6:00 PM MONDAY THROUGH FRIDAY, ADJUSTABLE.
- 2. TYPICAL SETPOINTS (ADJUSTABLE):**
- HEATING SPACE TEMPERATURE - 70 DEGREES FAHRENHEIT
 COOLING SPACE TEMPERATURE - 75 DEGREES FAHRENHEIT

MISCELLANEOUS CONTROLS

- A. GENERAL**
- PROVIDE AND INSTALL ALL NECESSARY DEVICES, RELAYS, SWITCHES, SENSORS, DAMPERS, CONDUIT, AND WIRING TO PROVIDE A COMPLETE AND OPERATIONAL DDC SYSTEM.
 - SYSTEM OCCUPANCY SCHEDULE SHALL BE COORDINATED WITH THE BUILDING OWNER.
 - PID LOOPS: WHENEVER A MOTOR RPM, DAMPER POSITION, OR VALVE POSITION IS TO BE MODULATED IN RESPONSE TO A SENSOR OUTPUT, A PID LOOP IS TO BE UTILIZED TO ACHIEVE THE DESIRED CONTROL FUNCTION. PID LOOP VARIABLES SHALL BE TUNED PER INDUSTRY STANDARDS.
 - PROPORTIONAL, INTEGRAL AND DERIVATIVE VARIABLES SHALL BE USED.
 - PROPORTIONAL CONTROL: WHENEVER THE TERM PROPORTIONAL IS USED IN THE SEQUENCES IT IS INTENDED THAT PID LOOPS ARE EMPLOYED TO ACHIEVE THAT CONTROL.
 - INTERLOCKS: PROVIDE ALL NECESSARY EQUIPMENT, DEVICES, WIRING, AND PROGRAMMING FOR INTERLOCK OF EQUIPMENT AS SHOWN ON EQUIPMENT SCHEDULES.
- B. TIMING OF CONTROL WORK**
- THE CONTROL SYSTEM SHALL BE COMPLETE PRIOR TO BALANCING OF THE PROJECT. CONTROL PERSONNEL ARE TO ASSIST IN SYSTEM OPERATION FOR THE BALANCER. THE CONTROL SYSTEM SHALL BE COMPLETE PRIOR TO HVAC SYSTEM COMMISSIONING AND CONTROL PERSONNEL ARE TO ASSIST IN SYSTEM OPERATION AND TESTING DURING COMMISSION. THE CONTROL SYSTEM SHALL BE COMMISSIONED PRIOR TO OWNER OCCUPANCY.
- C. INTERLOCKS:**
- PROVIDE ALL NECESSARY EQUIPMENT, DEVICES, WIRING AND PROGRAMMING FOR INTERLOCK OF EQUIPMENT AS SHOWN ON THE EQUIPMENT SCHEDULES.
- D. EMCS TRACK CHANGES:**
- EMCS SHALL RECORD SOFTWARE CHANGES AND USER LOGIN NAME FROM BEGINNING OF INSTALLATION.
- E. TRENDS:**
- ALL CONTROL SYSTEM INPUT AND OUTPUT POINTS SHALL BE ACCESSIBLE AND PROGRAMMED FOR TRENDS. A GRAPHIC TRENDS PACKAGE SHALL BE AVAILABLE.

WALL HEATERS

- GENERAL:**
- UNIT SHALL ACTIVATE TO MAINTAIN TEMPERATURE.
- TEMPERATURE SETPOINT:**
- TEMPERATURE SETPOINT IS 70°F (ADJUSTABLE)

GAS UNIT HEATERS

- GENERAL:**
- UNIT SHALL STAGE TO MAINTAIN SPACE TEMPERATURE.
 - TEMPERATURE SUBPOINT IS 50°F (ADJUSTABLE)

DOAS SEQUENCE

- GENERAL:**
- CONTROLLER SHALL BE PROVIDED WITH REQUIRED SENSORS AND PROGRAMMING FOR ROOFTOP UNIT. CONTROLLER SHALL BE FACTORY PROGRAMMED, MOUNTED AND TESTED. CONTROLLER SHALL HAVE A LCD READOUT FOR CHANGING SET POINTS AND MONITORING UNIT OPERATION.
- ZONE SPACE TEMPERATURE SENSORS SHALL BE EQUIPPED WITH PUSHBUTTONS TO PROVIDE UNOCCUPIED OVERRIDE REQUEST. OVERRIDE RUNTIME SHALL BE 2 HOURS (ADJUSTABLE).
 - UNIT SHALL BE PROGRAMMED FOR START/STOP THROUGH THE DDC SYSTEM BASED ON DESIGNED OCCUPIED MODES WITH WEEKDAY, WEEKEND, AND HOLIDAY SCHEDULES.
 - OCCUPIED/UNOCCUPIED MODES: SHALL BE BASED ON A 7-DAY TIME CLOCK INTERNAL TO THE CONTROLLER. THE SCHEDULE SHALL BE SET BY THE END USER.
- SUPPLY BLOWER SEQUENCE:** THE SUPPLY BLOWER IS PROVIDED WITH A FACTORY MOUNTED VARIABLE FREQUENCY DRIVE. THE SUPPLY BLOWER SPEED WILL BE CONTROLLED WITH THE FOLLOWING SEQUENCE.
- SUPPLY FAN SHALL START VIA A SCHEDULE (ADJUSTABLE) OR OVERRIDE COMMAND (ADJUSTABLE). OVERRIDE COMMAND CAN BE TRIGGERED BY A ZONE SPACE TEMPERATURE SENSOR UNOCCUPIED OVERRIDE REQUEST OR BY EMCS USER INTERFACE.
 - OUTSIDE AIR DAMPER SHALL OPEN UPON ACTIVATION AND FAN SHALL START VIA DAMPER END SWITCH. DAMPER SHALL FAIL CLOSED.
 - SUPPLY FAN SPEED VARIES TO MAINTAIN DUCT PRESSURE SETPOINT. SETPOINT SHALL RANGE BETWEEN 0.3" W.C. TO 1.0" W.C. (ADJUSTABLE) BASED ON MOTORIZED DAMPER POSITIONS. AIR BALANCER TO SELECT FINAL SETPOINTS.
 - FAN ALARMS:
 - FAN ALARM ACTIVATES IF FAN STATUS FAILS TO ACTIVATE AFTER FAN HAS BEEN STARTED. PROOF IS VIA SAIL SWITCH. EMCS RECORDS FAN ALARM.
 - HARDWIRE FAN SHUTDOWN UPON ACTIVATION OF FIRE/SMOKE ALARM. EMCS RECORDS FIRE/SMOKE ALARM.
 - HARDWIRE FAN SHUTDOWN UPON HIGH DUCT PRESSURE ALARM ACTIVATION. EMCS RECORDS HIGH PRESSURE ALARM.
- EXHAUST BLOWER SEQUENCE:** THE EXHAUST BLOWER IS PROVIDED WITH A FACTORY MOUNTED VARIABLE FREQUENCY DRIVE. THE EXHAUST BLOWER SPEED WILL BE CONTROLLED WITH THE FOLLOWING SEQUENCE.
- EXHAUST OPERATES WHENEVER THE SUPPLY FAN IS PROVEN ON.
 - EXHAUST DAMPER SHALL OPEN UPON ACTIVATION AND FAN SHALL START VIA DAMPER END SWITCH. DAMPERS SHALL FAIL CLOSED.
 - EXHAUST FAN SPEED VARIES TO MAINTAIN SPACE PRESSURE SETPOINT. SETPOINT SHALL RANGE BETWEEN 0.05" W.C. TO .12" W.C. (ADJUSTABLE) WITH RESPECT TO AMBIENT CONDITIONS. AIR BALANCER TO SELECT FINAL SETPOINTS.
 - FAN ALARMS:
 - FAN ALARM ACTIVATES IF FAN STATUS FAILS TO ACTIVATE AFTER FAN HAS BEEN STARTED. EMCS RECORDS FAN ALARM. PROOF IS VIA SAIL SWITCH.
 - HARDWIRE FAN SHUTDOWN UPON ACTIVATION OF FIRE/SMOKE ALARM. EMCS RECORDS FIRE/SMOKE ALARM.
 - HARDWIRE FAN SHUTDOWN UPON HIGH DUCT PRESSURE ALARM ACTIVATION. EMCS RECORDS HIGH PRESSURE ALARM.

DOAS SEQUENCE (CONTINUED)

- HEATING SEQUENCE:**
- THE HEATING IS CONTROLLED TO MAINTAIN THE SUPPLY TEMPERATURE SET POINT. THE HEATING WILL BE LOCKED OUT WHEN THE OUTSIDE AIR IS > 80 F.
 - INDIRECT GAS FURNACE: THE CONTROLLER WILL MODULATE THE INDIRECT GAS FURNACE TO MAINTAIN THE SUPPLY TEMPERATURE SET POINT (ADJ.).
- TEMPERATURE SETPOINTS:**
- THE CONTROLLER WILL MODULATE THE HEATING AND COOLING TO MAINTAIN AN ACTIVE SET POINT.
- OUTSIDE (OA) RESET: THE CONTROLLER WILL MONITOR THE OUTDOOR AIR TEMPERATURE AND ADJUSTS THE DESIRED SUPPLY TEMPERATURE SET POINT ACCORDINGLY. WHEN THE OUTDOOR AIR IS BELOW 55 F, THE CONTROLLER WILL CHANGE THE SUPPLY SET POINT TO 70 F. IF THE OUTDOOR AIR IS ABOVE 65 F, THE CONTROLLER WILL CHANGE THE SUPPLY SET POINT TO 55 F. IF THE OUTDOOR AIR TEMPERATURE IS BETWEEN 55 F AND 65 F, THE SUPPLY SET POINT CHANGES ACCORDING TO THE OUTDOOR AIR RESET FUNCTION.
 - BUILDING FREEZE PROTECTION: IF THE SUPPLY AIR TEMPERATURE DROPS BELOW 35 F (ADJ.) FOR 5 MINUTES (ADJ.), THE CONTROLLER WILL DE-ENERGIZE THE UNIT AND ACTIVATE THE ALARM OUTPUT AFTER A PRESET TIME DELAY.
 - TEMPERATURE PROTECTION: THE CONTROLLER WILL ENABLE THE SUPPLY FAN TO MODULATE DOWN TO HELP THE UNIT KEEP UP WITH HEATING DEMAND IN THE EVENT OF WHEEL FAILURE OR THE UNIT OPERATING OUTSIDE DESIGN CONDITIONS.
- ENERGY WHEEL FROST CONTROL:** FROST CONTROL FOR THE ENERGY WHEEL IS ENABLED WHEN FROST IS PRESENT ON THE WHEEL, BASED ON THE OUTSIDE AIR TEMPERATURE AND THE PRESSURE DROP ACROSS THE WHEEL. IF THE OUTDOOR AIR TEMPERATURE IS BELOW 5 F, ADJ. AND THE DIFFERENTIAL PRESSURE ACROSS THE WHEEL IS ABOUT 1.5", ADJ. FROST CONTROL WILL ENABLE.
- TIMED EXHAUST (100% OA ONLY): WHEN FROSTING IS OCCURRING, THE SUPPLY BLOWER IS CYCLED (30 MIN. ON / 5 MIN. OFF, ADJ.) TO ALLOW THE WARM EXHAUST AIR TO DEFROST THE WHEEL. ONCE THE PRESSURE DROP DECREASES BELOW THE SET POINT, FROST MODE IS DE-ENERGIZED AND THE SUPPLY BLOWER IS NO LONGER CYCLED.

- ECONOMIZER SEQUENCE:** WHEN THE APPLICATION REQUIRES COOLING, AND THE OUTDOOR AIR CONDITIONS ARE SUITABLE FOR FREE COOLING, THE CONTROLLER WILL MODULATE THE ENERGY WHEEL SPEED TO MAINTAIN THE SUPPLY AIR TEMPERATURE SET POINT.
- DEW POINT/DRY BULB: THE ECONOMIZER WILL BE LOCKED OUT WHEN THE OUTSIDE AIR IS < 40 F DB (ADJ.) OR > 75 F DB (ADJ.) OR > 55 F DEW POINT (ADJ.), OR THERE IS A CALL FOR HEATING.

- MISCELLANEOUS ALARMS INDICATION:** THE CONTROLLER WILL DISPLAY ALARMS AND HAVE ONE DIGITAL OUTPUT FOR REMOTE INDICATION OF AN ALARM CONDITION. ALARMS INCLUDE:
- DIRTY WHEEL ALARM: THE CONTROLLER MONITORS PRESSURE ACROSS THE WHEEL AND SENDS AN ALARM IN THE CASE OF AN INCREASED PRESSURE DROP.
 - TEMPERATURE SENSOR ALARM: THE CONTROLLER SENDS AN ALARM IN THE CASE OF A FAILED AIR TEMPERATURE SENSOR.

- ACCESSORIES:** THE FOLLOWING ACCESSORIES WILL BE INCLUDED WITH THE UNIT TO EXPAND THE FUNCTIONALITY OR USABILITY OF THE CONTROLLER.
- MICROPROCESSOR M-NET: UNIT WILL BE CONTROLLED THROUGH THE DDC CONTROLLER AND COMMUNICATION TO M-NET THROUGH A FACTORY-MOUNTED CONTROLLER M-NET AND CONTROL MONITOR THE FOLLOWING:
- UNIT ENABLE/DISABLE
 - SUPPLY TEMPERATURE SET POINT OR COLD COIL TEMPERATURE SET POINT
 - GLOBAL ALARMS
- PHASE AND BROWNOUT PROTECTION: FACTORY MOUNTED AND WIRED COMPONENT WHICH MONITORS THE MAIN POWER COMING INTO THE UNIT. IF A PHASE DROPS OUT, OR IF THE INCOMING VOLTAGE EXCEEDS THE ACCEPTABLE RANGE, THE COMPONENT WILL TURN OFF THE UNIT TO HELP PROTECT THE ELECTRICAL SYSTEMS.

- OCCUPANCY SENSORS:**
- WHERE SHOWN ON PLANS, OCCUPANCY SENSORS SHALL CONTROL ROOM MOTORIZED DAMPERS. IF ROOM IS UNOCCUPIED FOR 5 MINUTES (ADJUSTABLE), MOTORIZED DAMPERS SHALL CLOSE.

SPLIT SYSTEM CONTROL SEQUENCE

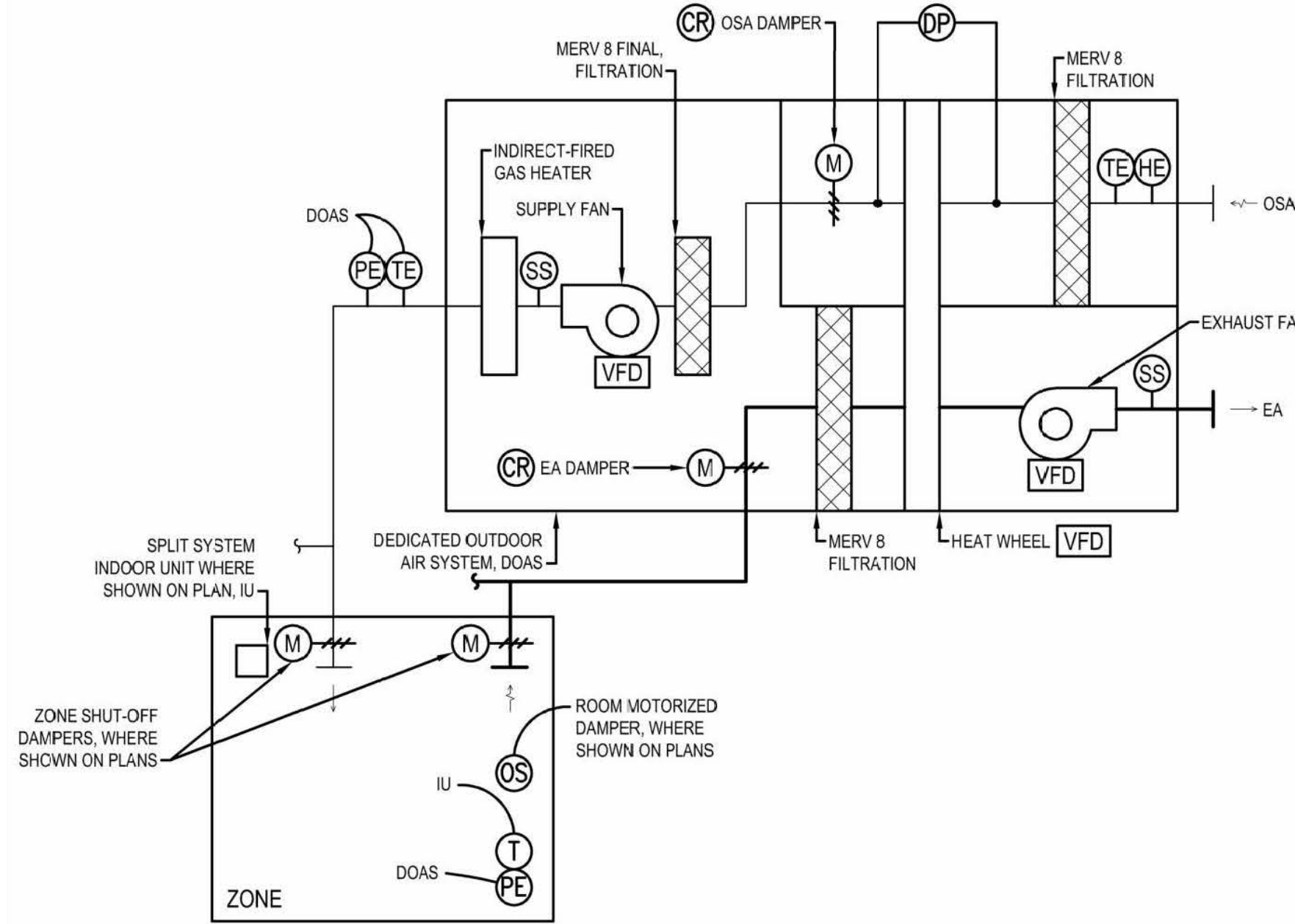
- GENERAL:**
- SPLIT SYSTEMS INDOOR/OUTDOOR UNITS SHALL BE CONTROLLED BY LOCAL THERMOSTAT. UNITS SHALL OPERATE ON INTERNAL CONTROLS TO MAINTAIN ROOM SETPOINT.
- TEMPERATURE SETPOINT:**
- IDF ROOMS: SPACE AIR TEMPERATURE SETPOINT IS 75°F (ADJUSTABLE) FOR COOLING CONTROL.
 - EQUIPMENT ROOMS: SPACE AIR TEMPERATURE SETPOINT IS 70°F (ADJUSTABLE) FOR HEATING CONTROL AND 75°F (ADJUSTABLE) FOR COOLING CONTROL.

EXHAUST FANS

- EF-C1:**
- FAN SHALL OPERATE ON OCCUPANCY SCHEDULE
 - FAN ALARM SHALL ACTIVATE IF FAN STATUS FAILS TO ACTIVATE AFTER FAN HAS BEEN STARTED.
- EF-C2:**
- FAN SHALL OPERATE 100% WHEN DOAS-01 EXHAUST FAN IS RUNNING.

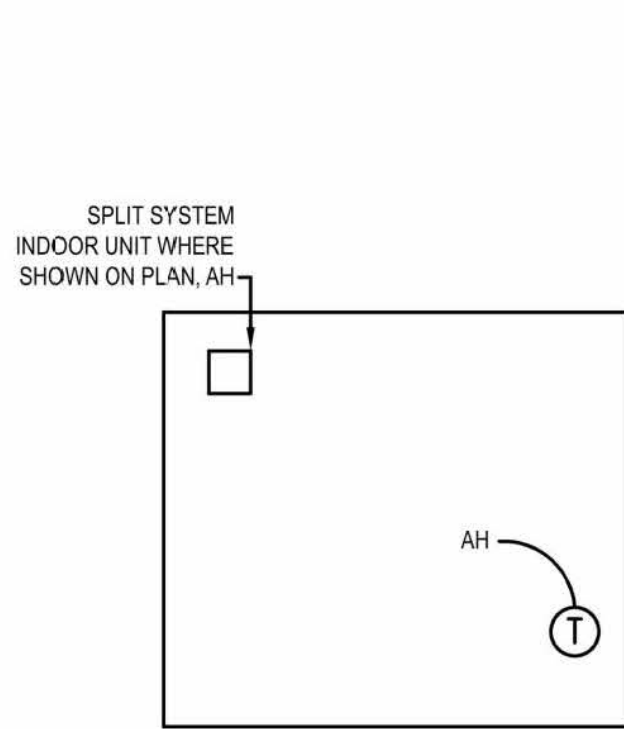
VRF CONTROL SEQUENCE

- GENERAL:**
- A. ON/OFF CONTROL: THE INDOOR UNITS CAN BE COMMANDED ON/OFF EITHER BY A SCHEDULE IN THE CENTRAL CONTROLLER OR AT THE REMOTE CONTROLLER. IF ALL INDOOR UNITS ARE OFF, THE OUTDOOR UNIT SHALL TURN OFF.
- B. NIGHT SETBACK MODE: THE SYSTEM SHALL CYCLE ON DURING UNOCCUPIED PERIODS AS NEEDED TO MAINTAIN UNOCCUPIED TEMPERATURE SET POINT.
- C. SPACE TEMPERATURE CONTROL: THE INDOOR UNIT SHALL MODULATE ITS INTERNAL LINEAR EXPANSION VALVE TO MAINTAIN THE TEMPERATURE SET POINT VIA THE INDOOR UNITS INTERNAL CONTROLS.
- THE SET POINT IS ADJUSTABLE AT THE REMOTE CONTROLLER OR CENTRAL CONTROLLER. THE TEMPERATURE SET POINT CAN ALSO BE SCHEDULED AT THE REMOTE CONTROLLER OR THE CENTRAL CONTROLLER.
- D. MODE CONTROL:
- AUTO MODE:
 - THE INDOOR UNIT SHALL DETERMINE WHETHER IT SHOULD BE IN AUTO-HEAT MODE OR AUTO-COOL MODE BASED ON SPACE TEMPERATURE RELATIVE TO TEMPERATURE SET POINT. IF THE INDOOR UNIT IS IN AUTO HEAT MODE, THE INDOOR UNIT CONTROL BOARD SHALL FOLLOW THE HEAT MODE SEQUENCE: IF THE INDOOR UNIT IS IN AUTO COOL MODE, THE INDOOR UNIT CONTROL BOARD SHALL FOLLOW THE COOL MODE SEQUENCE.
 - THE INDOOR UNIT SHALL SWITCH FROM AUTOHEAT TO AUTOCOOL WHEN THE SPACE TEMPERATURE RISES ABOVE AND REMAINS ABOVE THE TEMPERATURE SET POINT PLUS THE DEAD BAND FOR 3 MINUTES.
 - THE INDOOR UNIT WILL SWITCH FROM AUTOCOOL TO AUTOHEAT WHEN THE SPACE TEMPERATURE DROPS BELOW AND REMAINS BELOW THE TEMPERATURE SET POINT MINUS THE DEAD BAND FOR 3 MINUTES.
 - HEATING MODE: THE INDOOR UNIT SHALL MODULATE ITS LINEAR EXPANSION VALVE TO MAINTAIN TEMPERATURE SET POINT.
 - COOLING MODE: THE INDOOR UNIT SHALL MODULATE ITS LINEAR EXPANSION VALVE TO MAINTAIN TEMPERATURE SET POINT.
- E. FAN/VANE CONTROL: FAN SPEED AND VANE DIRECTION (IF APPLICABLE) SHALL BE ADJUSTABLE BY THE USER AT THE REMOTE CONTROLLER AND/OR THE CENTRAL CONTROLLER.
- F. TEMPERATURE SETPOINT:
- EQUIPMENT ROOMS: SPACE AIR TEMPERATURE SETPOINT IS 70°F (ADJUSTABLE) FOR HEATING CONTROL AND 75°F (ADJUSTABLE) FOR COOLING CONTROL.



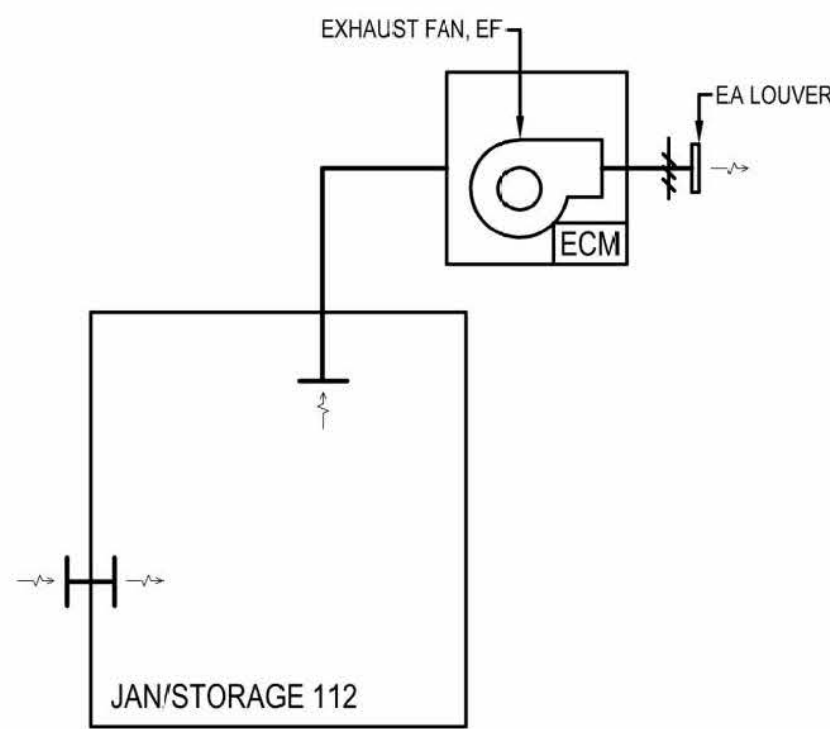
DOAS SYSTEM FLOW DIAGRAM

NOT TO SCALE



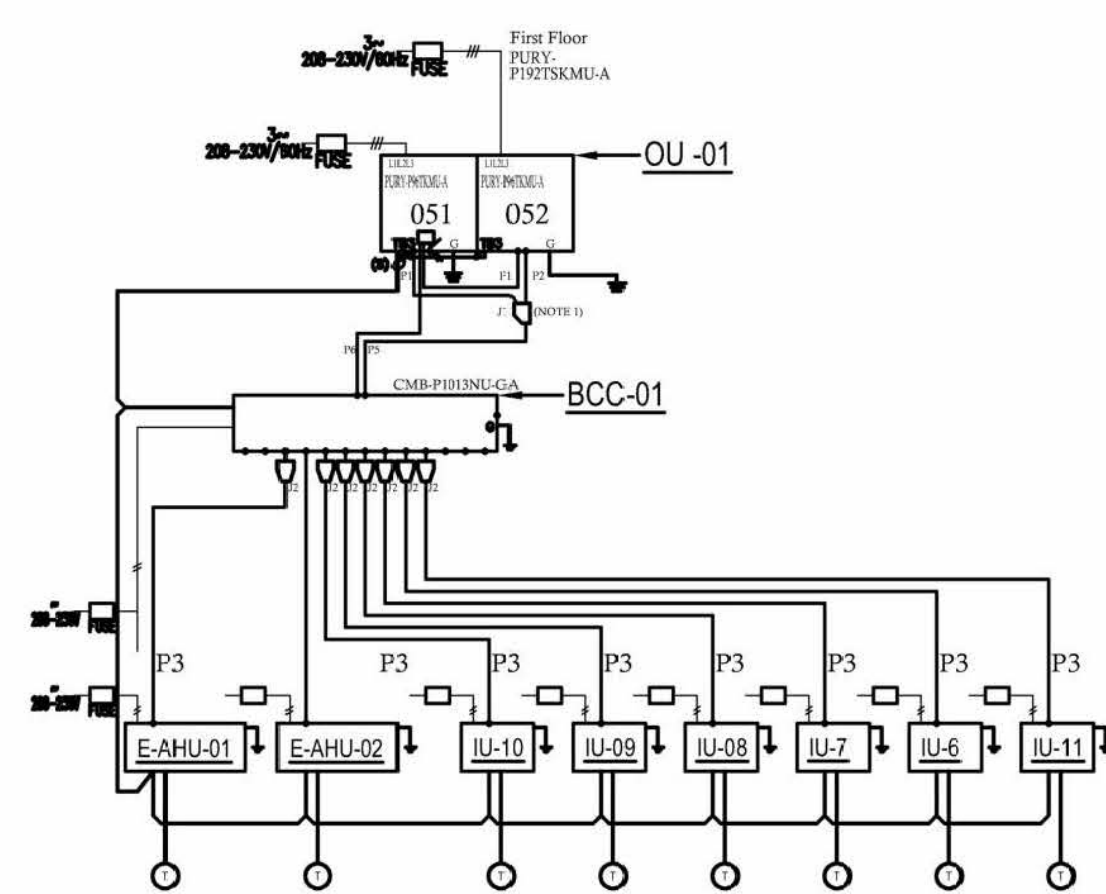
ELEVATOR MACHINE ROOM

NOT TO SCALE



JANITOR'S CLOSET

NOT TO SCALE



1 FLOW DIAGRAM

SCALE: NTS

GENERAL NOTES

- PIPING IS SCHEMATIC IN NATURE CONTRACTOR TO PROVIDE ADDITIONAL FITTINGS AND OFFSETS AS REQUIRED TO INSTALL A COMPLETE AND FUNCTIONING SYSTEM.

DIAGRAM SYMBOL LEGEND

- POWER WIRE
- CONTROL WIRE
- REFER. PIPING



REVISIONS	CHANGE	PERMIT SET
DATE	DATE	DATE
03/23/2022	05/20/2022	07/25/2022
GAS PIPING REVISION		
NO PIPING REVISION DOAS DUCT RELOCATION		
DRAWN	DESIGN	DATE
RPG	BSM	03/23/2022
APPROVED		

CASCADE CHRISTIAN JUNIOR HIGH
 SEQUENCE OF OPERATIONS I
 815 21ST STREET SE
 PUYALLUP, WASHINGTON 98372

AIR SYSTEMS ENGINEERING INC.
 COMFORT SYSTEMS USA
 AIR CONDITIONING / SHEET METAL / REFRIGERATION / PROFESSIONAL ENGINEERS / SERVICE & MAINTENANCE

City of Puyallup
 Development & Permitting Services
ISSUED PERMIT

Building	Planning
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B-21-0727

SHEET NO. **M9** OF **9**
 JOB NO. **4126**